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Walk-Behind Rollers

RS 800A
RSS 800A

OPERATOR'S MANUAL

0163165EN

5. Maintenance 25

CALIFORNIA

Proposition 65 Warning:

Engine exhaust, some of its constituents, and certain vehicle components, contain or emit chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

1. Foreword

This manual provides information and procedures to safely operate and maintain this Wacker model. For your own safety and protection from injury, carefully read, understand and observe the safety instructions described in this manual.

Keep this manual or a copy of it with the machine. If you lose this manual or need an additional copy, please contact Wacker Corporation. This machine is built with user safety in mind; however, it can present hazards if improperly operated and serviced. Follow operating instructions carefully! If you have questions about operating or servicing this equipment, please contact Wacker Corporation.

The information contained in this manual was based on machines in production at the time of publication. Wacker Corporation reserves the right to change any portion of this information without notice.

2. Safety Information

This manual contains DANGER, WARNING, CAUTION, *NOTICE* and NOTE callouts which must be followed to reduce the possibility of personal injury, damage to the equipment, or improper service.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE: Used without the safety alert symbol, ***NOTICE*** indicates a hazardous situation which, if not avoided, could result in property damage

Note: *Contains additional information important to a procedure*.

2.1 Operating Safety

WARNING

Familiarity and proper training are required for the safe operation of equipment. Equipment operated improperly or by untrained personnel can be dangerous. Read the operating instructions contained in both this manual and the engine manual and familiarize yourself with the location and proper use of all controls. Inexperienced operators should receive instruction from someone familiar with the equipment before being allowed to operate the machine.

2.1.1 NEVER operate this machine in applications for which it is not intended.

2.1.2 NEVER touch the engine or muffler while the engine is on or immediately after it has been turned off. These areas get hot and may cause burns.

2.1.3 NEVER use accessories or attachments that are not recommended by Wacker. Damage to equipment and injury to the user may result.

2.1.4 ALWAYS wear protective clothing appropriate to the job site when operating equipment.

2.1.5 ALWAYS remain aware of moving parts and keep hands, feet, and loose clothing away from the moving parts of the equipment.

2.1.6 ALWAYS read, understand, and follow procedures in the Operator's Manual before attempting to operate the equipment.

2.1.7 ALWAYS check that all controls are functioning properly immediately after start-up! DO NOT operate machine unless all controls operate correctly.

2.1.8 ALWAYS remain aware of changing positions and movement of other equipment and personnel on the job site.

2.1.9 ALWAYS remain aware of changing surface conditions and use extra care when operating over uneven ground, on hills, or over soft or coarse material. The machine could shift or slide unexpectedly.

2.1.10 ALWAYS use caution when operating near the edges of pits, trenches or platforms. Check to be sure ground surface is stable enough to support the weight of the machine and operator and there is no danger of the machine sliding, falling or tipping.

2.1.11 ALWAYS operate machine with all safety devices and guards in place and in working order. DO NOT modify or defeat safety devices. DO NOT operate machine if any safety devices or guards are missing or inoperative.

2.1.12 ALWAYS position yourself safely when operating machine in reverse or on hills. Leave enough space between yourself and the machine so you will not be placed in a hazardous position should the machine slide or tip.

2.1.13 ALWAYS operate the machine with both feet on the ground! DO NOT stand, sit, or ride on machine while in operation.

2.2 Operator Safety While Using Internal Combustion Engines

DANGER

Internal combustion engines present special hazards during operation and fueling. Read and follow the warning instructions in the engine owner's manual and the safety guidelines below. Failure to follow the warnings and safety guidelines could result in severe injury or death.

2.2.1 DO NOT smoke while operating the machine.

2.2.2 DO NOT smoke when refueling the engine.

2.2.3 DO NOT refuel a hot or running engine.

2.2.4 DO NOT refuel the engine near an open flame.

2.2.5 DO NOT run the engine near open flames.

2.2.6 DO NOT run the machine indoors or in an enclosed area such as a deep trench unless adequate ventilation, through such items as exhaust fans or hoses, is provided. Exhaust gas from the engine contains poisonous carbon monoxide gas; exposure to carbon monoxide can cause loss of consciousness and may lead to death.

2.2.7 ALWAYS refill the fuel tank in a well-ventilated area.

2.2.8 ALWAYS replace the fuel tank cap after refueling.

2.2.9 ALWAYS check the fuel lines and the fuel tank for leaks and cracks before starting the engine. Do not run the machine if fuel leaks are present or the fuel lines are loose.

2.2.10 ALWAYS keep the area around a hot exhaust pipe free of debris to reduce the chance of an accidental fire.

2.3 Service Safety

WARNING

Poorly maintained equipment can become a safety hazard! In order for the equipment to operate safely and properly over a long period of time, periodic maintenance and occasional repairs are necessary.

2.3.1 DO NOT attempt to clean or service the machine while it is running. Rotating parts can cause severe injury.

2.3.2 DO NOT remove air cleaner cover, paper element, or precleaner while engine is running.

2.3.3 DO NOT use gasoline or other types of fuels or flammable solvents to clean parts, especially in enclosed areas. Fumes from fuels and solvents can become explosive.

2.3.4 ALWAYS replace the safety devices and guards after repairs and maintenance.

2.3.5 ALWAYS replace worn or damaged components with spare parts designed and recommended by Wacker Corporation.

2.3.6 ALWAYS keep the machine clean and labels legible. Replace all missing and hard-to-read labels. Labels provide important operating instructions and warn of dangers and hazards.

2.3.7 ALWAYS check all external fasteners at regular intervals.

2.3.8 ALWAYS make sure slings, chains, hooks, ramps, jacks and other types of lifting devices are attached securely and have enough weight-bearing capacity to lift or hold the machine safely. Always remain aware of the location of other people around when lifting the machine.

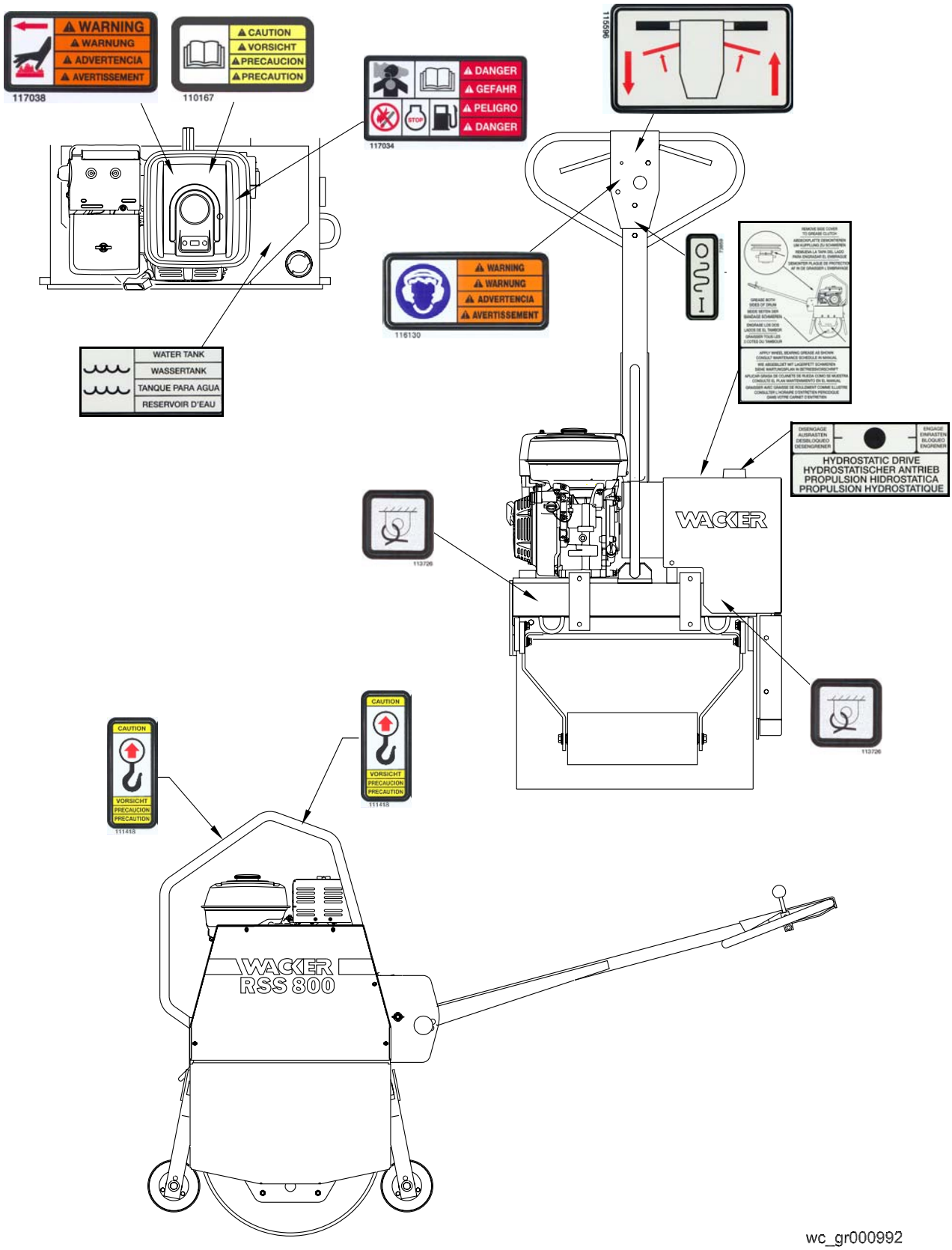
2.3.9 DO NOT crank a flooded engine with the spark plug removed on gasoline-powered engines. Fuel trapped in the cylinder will squirt out the spark plug opening.

2.3.10 DO NOT test for spark on gasoline-powered engines if the engine is flooded or the smell of gasoline is present. A stray spark could ignite the fumes.

2.3.11 ALWAYS keep the area around the muffler free of debris such as leaves, paper, cartons, etc. A hot muffler could ignite the debris and start a fire.

2.3.12 ALWAYS disconnect the spark plug on machines equipped with gasoline engines, before servicing, to avoid accidental start-up.

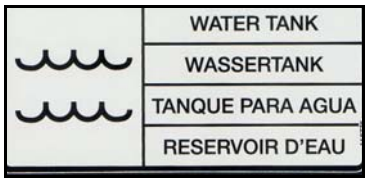
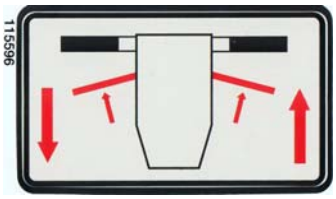
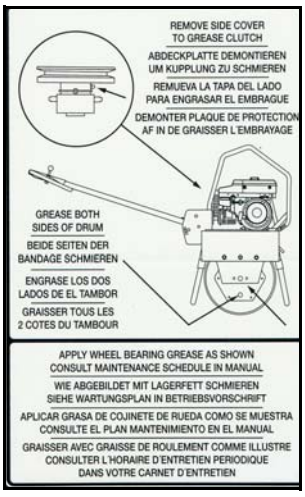
2.4 Label Locations

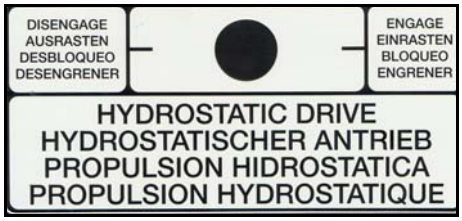
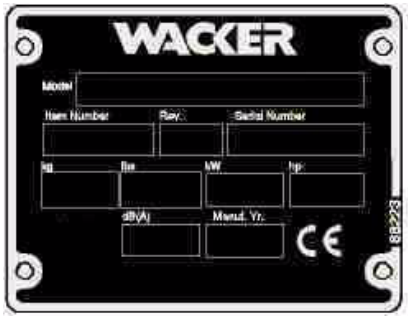


2.5 Safety Labels

Wacker machines use international pictorial labels where needed. These labels are described below:

Label	Meaning
	DANGER! Engines emit carbon monoxide; operate only in well-ventilated area. Read the Operator's Manual. No sparks, flames, or burning objects near the machine. Shut off the engine before refueling.
	WARNING! Hot surface!
	CAUTION! Read and understand the supplied Operator's Manuals before operating this machine. Failure to do so increases the risk of injury to yourself or others.
	CAUTION! Use only clean, filtered diesel fuel.
	CAUTION! Lifting point.

Label	Meaning
	WARNING! To prevent hearing loss, wear hearing protection when operating this machine.
	Tie-down point.
	Water Tank
	Vibration Control ON/OFF.
	Control Lever: Forward and reverse motion controlled by red levers.
	Grease points: Inspect and lubricate every 100 hours of operation.

Label	Meaning
	Hydrostatic Drive: Engage / Disengage
	A nameplate listing the model number, item number, revision number, and serial number is attached to each unit. Please record the information found on this plate so it will be available should the nameplate become lost or damaged. When ordering parts or requesting service information, you will always be asked to specify the model number, item number, revision number, and serial number of the unit.
	This machine may be covered by one or more patents.

3. Technical Data

3.1 Engine

Part No.		RS 800A 0006581	RSS 800A 0006582
Engine			
Engine Type		4-stroke, overhead valve, single cylinder	
Engine Make		Honda	
Engine Model		GX 340 K1 QA2	GX 340 K1 QAE2
Rated Power	kW (Hp)	8.2 (11.0)	
Spark Plug		(NGK) BR 6ES	
Electrode Gap	mm (in)	0.028–0.031 (0.7–0.8)	
Engine Speed	rpm	2400–2500	
Valve Clearance (cold) intake: exhaust:	mm (in.)	 0.15 (0.006) 0.20 (0.008)	
Air Cleaner	type	Dual Element	
Engine Lubrication	oil grade	SAE 10W30 Service Class SF, SG	
Engine Oil Capacity	l (oz.)	1.1 (37)	
Fuel	type	Regular unleaded gasoline	
Fuel Tank Capacity	l (qts.)	6.8 (7.2)	

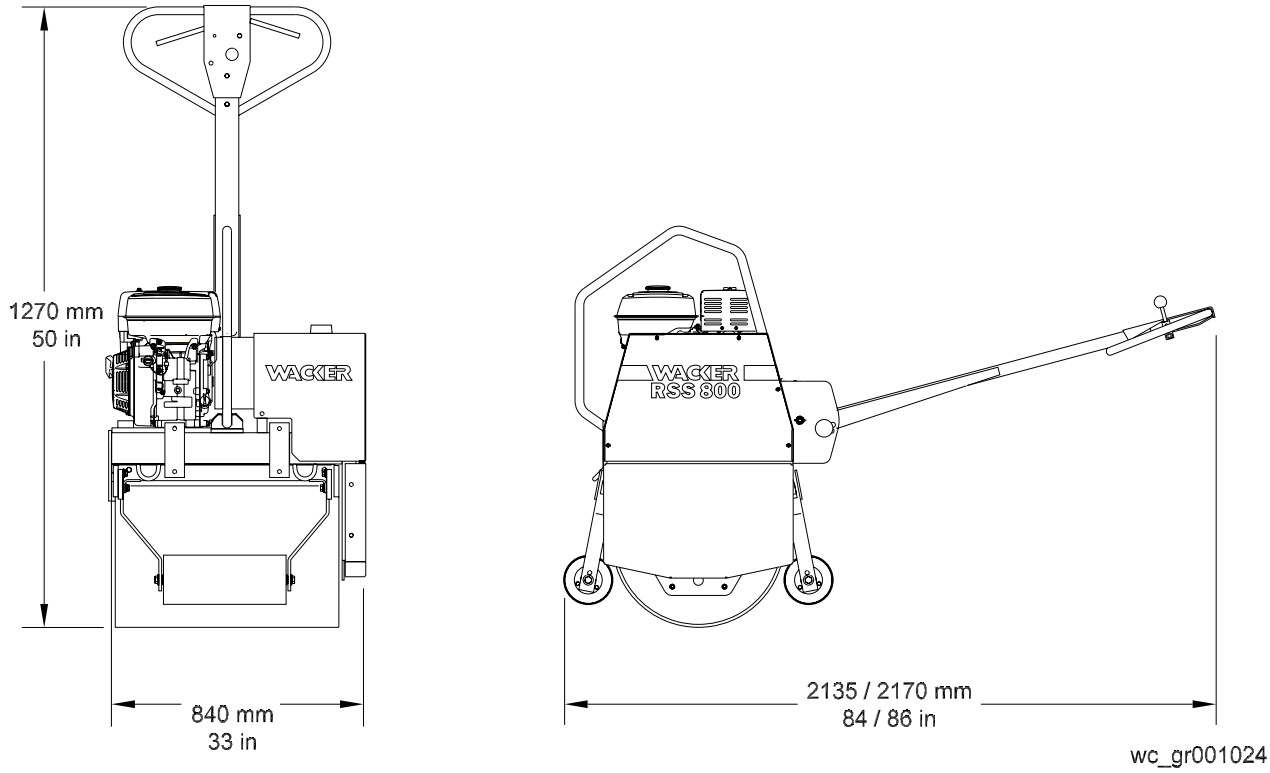
3.2 Roller

Item No.		RS800A 0006581	RSS800A 0006582
Roller			
Weight	kg (lbs.)	450 (1000)	465 (1025)
Area capacity	m² (ft²) / hr.	2630 (28300)	
Forward speed (max.)	m (ft) / min.	0–61 (0–200)	
Reverse speed (max.)	m (ft) / min.	0–46 (0–150)	
Vibration frequency	Hz (vpm)	70 (420)	
Gradability	%	15	
Water tank capacity	l (gal)	30 (8)	

3.3 Lubrication

Part No.		RS 800A 0006581	RSS 800A 0006582
Lubrication			
Gear case	type / qty.	SAE 90W Gear Lube Oil / 175 ml (6.0 oz)	
Hydrostatic transmission		SAE 10W30 Class SE	
Grease fittings		No. 2 EMB	

3.4 Dimensions



Notes

4. Operation

4.1 Operation and Service Locations

See Graphic: wc_gr003471

RSS 800A

Ref.	Description	Ref.	Description
1	Handle locking pin	7	Exciter control
2	Sprinkler tube	8	Water fill cap
3	Water control valve	9	Fuel tank
4	Scraper bar	10	Lifting eye
5	Tie-down	11	Hydrostatic drive release
6	Forward/reverse control lever	12	Control box

RS 800A

Ref.	Description	Ref.	Description
1	Handle locking pin	7	Exciter control
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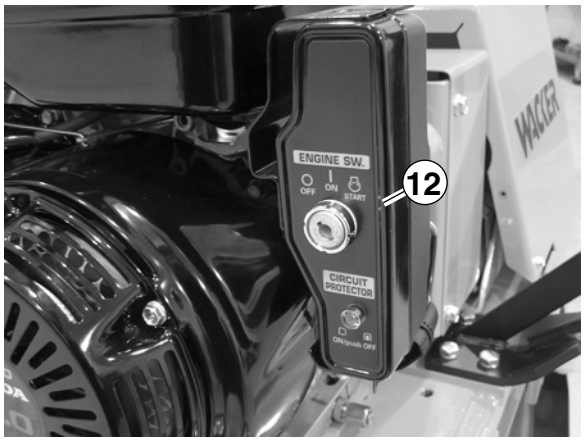
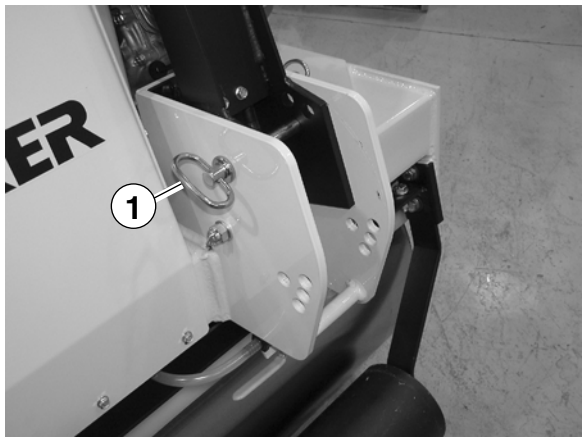
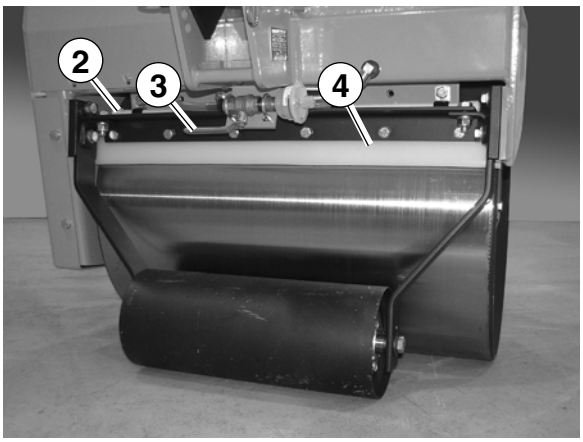
6	Forward/reverse control lever		


ENGINE SW.
OFF
ON
START
12
CIRCUIT PROTECTOR
ON/push OFF
WACKER


1


2
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4


10
6
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WACKER
WACKER
RSS 800

wc_gr003471

4.2 Application

This machine is designed for compaction of sand, gravel, soil and asphalt. The RS 800 has tight clearances, making it ideally suited for small repairs and maintenance of roads, walks, bridges, and parking lots. The high exciter forces ensure excellent compaction of cohesive-type soils, as well as loose soils and gravel. The sprinkler system and water control valve allow the roller to be used wet or dry.

4.3 Recommended Fuel (RS 800A, RSS 800A)

The engine requires regular grade unleaded gasoline. Use only fresh, clean gasoline. Gasoline containing water or dirt will damage fuel system. Consult engine Owner's Manual for complete fuel specifications.

4.4 Before Starting

4.4.1 Read and understand the safety and operating instructions at the beginning of this manual.

4.4.2 Check:

- Oil level in the engine
- Fuel level
- Condition of the air cleaner
- Tightness of the external fasteners
- Condition of the fuel lines

4.5 To Start (RS 800A)

See Graphic: wc_gr000014

4.5.1 Open fuel valve by moving lever to the right **(a1)**.

Note: *If engine is cold, move choke lever to close position* **(b1)**. *If engine is hot, set choke to open position* **(b2)**.

4.5.2 Turn engine switch to “ON” **(e1)**.

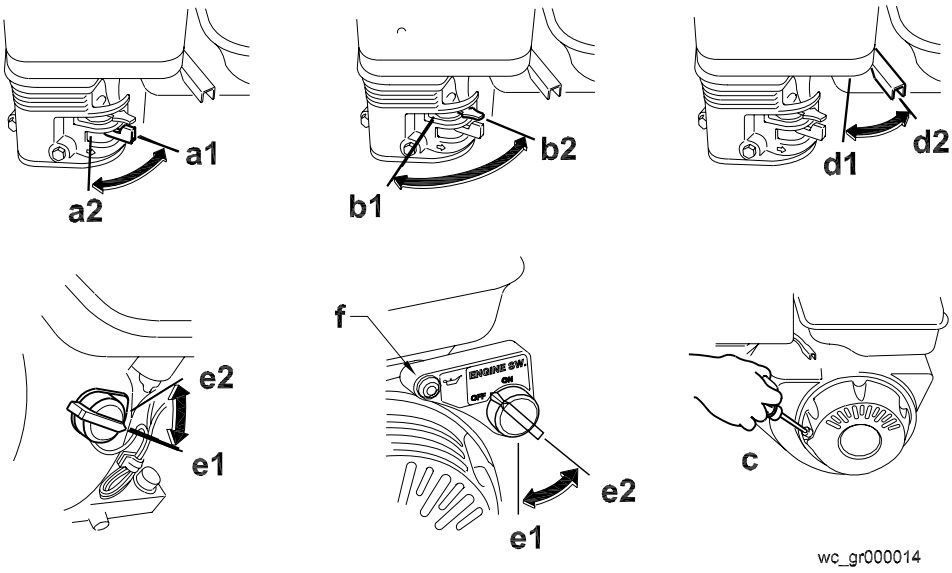
4.5.3 Open throttle by moving it slightly to left **(d1)**.

4.5.4 Pull starter rope **(c)**.

Note: *If the oil level in the engine is low, the engine will not start. If this happens, add oil to engine. Some engines are equipped with an oil alert light* **(f)** *that will come on while pulling the starter rope.*

4.5.5 Open choke as engine warms **(b2)**.

4.5.6 Open throttle fully to operate.



4.6 To Stop (RS 800A)

See Graphic: wc_gr000014

4.6.1 Reduce engine RPM to idle by moving throttle completely to right **(d2)**.

4.6.2 Turn engine switch to “OFF” **(e2)**.

4.6.3 Close fuel valve by moving lever to the left **(a2)**.

4.7 To Start (RSS 800A)

See Graphic: wc_gr003472

4.7.1 Open the fuel valve by moving the lever to the right **(a1)**.

Note: *If the engine is cold, move the choke lever to the closed position* **(b1)**. *If the engine is hot, set the choke to the open position* **(b2)**.

4.7.2 Open the throttle by moving it slightly to left **(d2)**.

4.7.3 Turn and hold the keyswitch in the “START” position **(c2)** to start the engine.

CAUTION

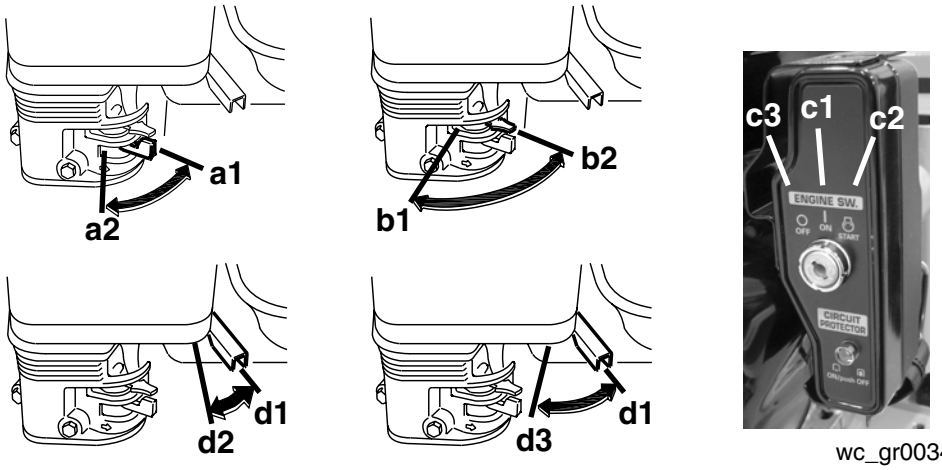
DO NOT hold the keyswitch in the “START” position for more than five seconds. Damage to the starter may result.

Note: *If the engine does not start within five seconds, turn the keyswitch to “OFF”, wait ten seconds, then turn the keyswitch to “START” again.*

4.7.4 When the engine starts, release the keyswitch and allow it to return to the “ON” position **(c1)**

4.7.5 Open the choke **(b2)** as the engine warms.

4.7.6 Place the throttle in the full open position **(d3)** to operate.



wc_gr003472

4.8 To Stop (RSS 800A)

See Graphic: wc_gr003472

4.8.1 Reduce the engine RPM to idle by moving the throttle lever completely to right **(d1)**.

4.8.2 Turn the keyswitch to the “OFF” position **(e2)**.

4.8.3 Close the fuel valve by moving the lever to the left **(a2)**.

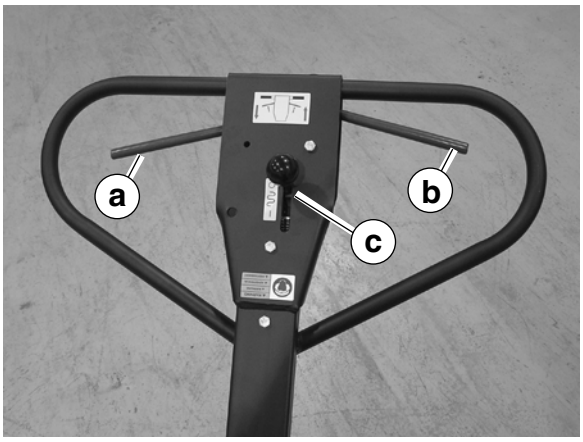
4.9 Direction and Speed Control

See Graphic: wc_gr003473

Travel direction and speed is controlled by the travel lever. To move in the forward direction, pull (toward the operator) on the right side **(a)** of the travel lever. To move in the reverse direction, pull (toward the operator) the left side **(b)** of the travel lever. The further toward the operator the lever is pulled, the faster the machine will travel. When neither side of the travel lever is pulled, the travel lever is spring-centered to the stopped position.

CAUTION

Keep both hands on the guide handle while operating the machine. The guide handle may pivot rapidly when the machine changes travel direction. This sudden movement of the guide handle can cause injury if the guide handle is not under control.



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4.10 Exciter (Vibration) Control

See Graphic: wc_gr003473

The exciter provides the vibration and can be used in most applications involving cohesive-type soils with heavy clay content, as well as loose soils and gravel.

The vibration is controlled by the lever **(c)** on the guide handle. Moving the lever forward turns the vibration ON and reverse to turn the vibration OFF.

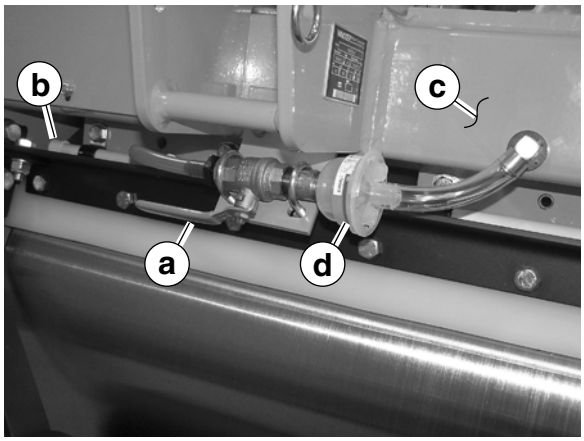
CAUTION

DO NOT run machine with the vibration on over hard surfaces like concrete or compacted asphalt. The drum bearings can be damaged.

4.11 Watering System

See Graphic: wc_gr003474

The RS 800 is equipped with a water control valve **(a)** which allows the roller to be used wet or dry, and a sprinkler system **(b)** to distribute the water evenly across the drum. The water is gravity fed from the water tank **(c)** through the filter **(d)** to the sprinkler when the control valve is in the open position (shown closed).



wc_gr003474

4.12 Handle Adjustment

See Graphic: wc_gr003475

The handle is adjustable to various angles required for different applications and to improve operator comfort. The handle rotates vertically for convenient transportation and storage.

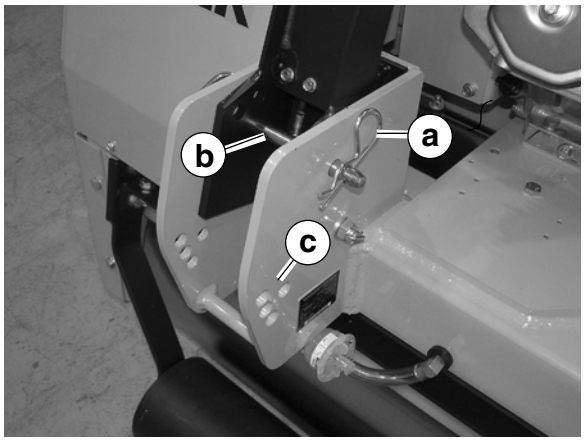
CAUTION

Support the handle at all times during adjustment. To avoid injury, NEVER position yourself directly under the handle.

To adjust the handle:

4.12.1 Remove the cotter pin **(a)** and the hitch pin **(b)**.

4.12.2 Rotate the handle to the desired height until the holes in the handle align with the holes **(c)** in the frame. Insert hitch pin and secure it with the cotter pin.



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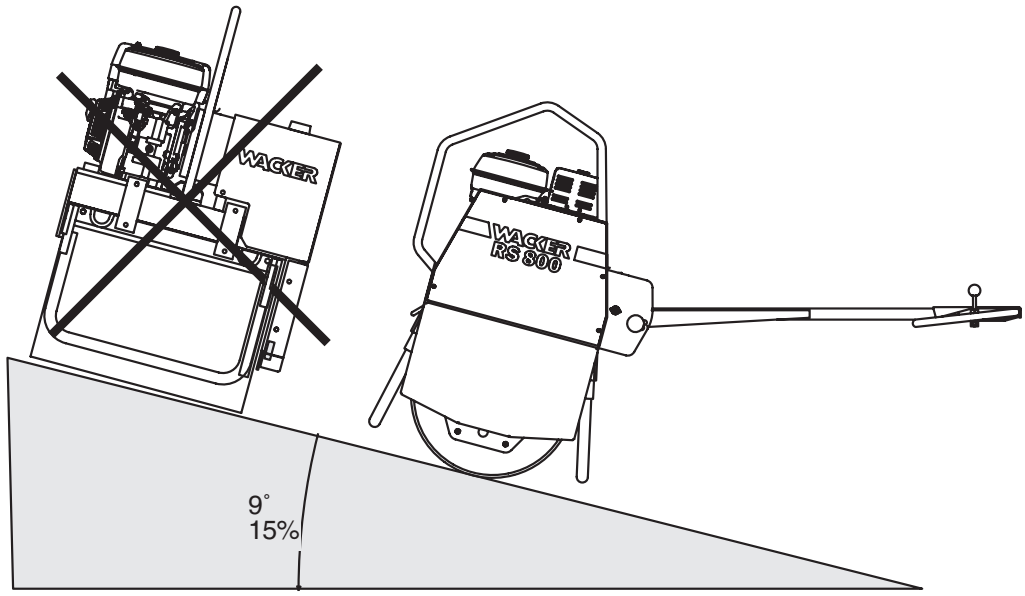
4.13 Operation on Slopes

See Graphic: wc_gr001005

When operating on slopes or hills, special care must be taken to reduce the risk of personal injury or damage to the equipment. Always operate the machine up and down hills rather than from side to side. For safe operation and for protection of the engine, continuous duty use should be restricted to front/rear slopes of 9° (15% grade) or less.

WARNING

NEVER operate the machine sideways on slopes. The machine may roll over, even on stable ground.



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4.14 Rollovers

Proper operation of the machine on slopes will prevent rollovers. If a machine rollover does occur, care must be taken to prevent damage to the engine. In this position, oil from the engine crankcase can flow into the combustion chamber, which can severely damage the engine next time it is started. If the machine has rolled on its side, **immediate** steps should be taken to right the machine.

NOTICE: To prevent damage to the engine after a rollover, the machine must NOT be started, AND must be serviced to remove any oil that may have been trapped in the combustion chambers. Contact your local Wacker dealer for instructions or servicing.

5. Maintenance

5.1 Periodic Maintenance Schedule

The chart below lists basic engine maintenance. Refer to the engine manufacturer's Operation Manual for additional information on engine maintenance.

Honda	Daily before starting	After first 20 hrs.	Every 50 hrs.	Every 100 hrs.	Every 300 hrs.
Check the fuel level.	■				
Check the engine oil level.	■				
Inspect the air filter. Replace as needed.	■				
Check the external hardware.	■				
Clean the air cleaner element.*			■		
Inspect the shockmounts for damage.				■	
Change the engine oil.*		■		■	
Clean the sediment cup or fuel strainer.				■	
Check and clean the spark plug.				■	
Check and adjust the valve clearance.					■
Clean the fuel tank.*					■
Check condition of the fuel line. Replace when necessary.					■

*Service more frequently in dusty conditions.

Machine	Daily before starting	Every 50 hrs.	Every 100 hrs.	Every 300 hrs.
Check external hardware.	■			
Clean battery terminals (RSS 800A)		■		
Check/adjust belt tension.		■		
Check oil level in gear case.		■		
Grease exciter bearings.			■	
Grease drum bearings.			■	
Grease clutch bearing.			■	
Check and adjust scraper bars.			■	
Check oil in hydrostatic transmission			■	
Check shock mounts; replace if cracked or split.				■
Change oil in gear case.				■

5.2 Lubrication

See Graphic: wc_gr003494

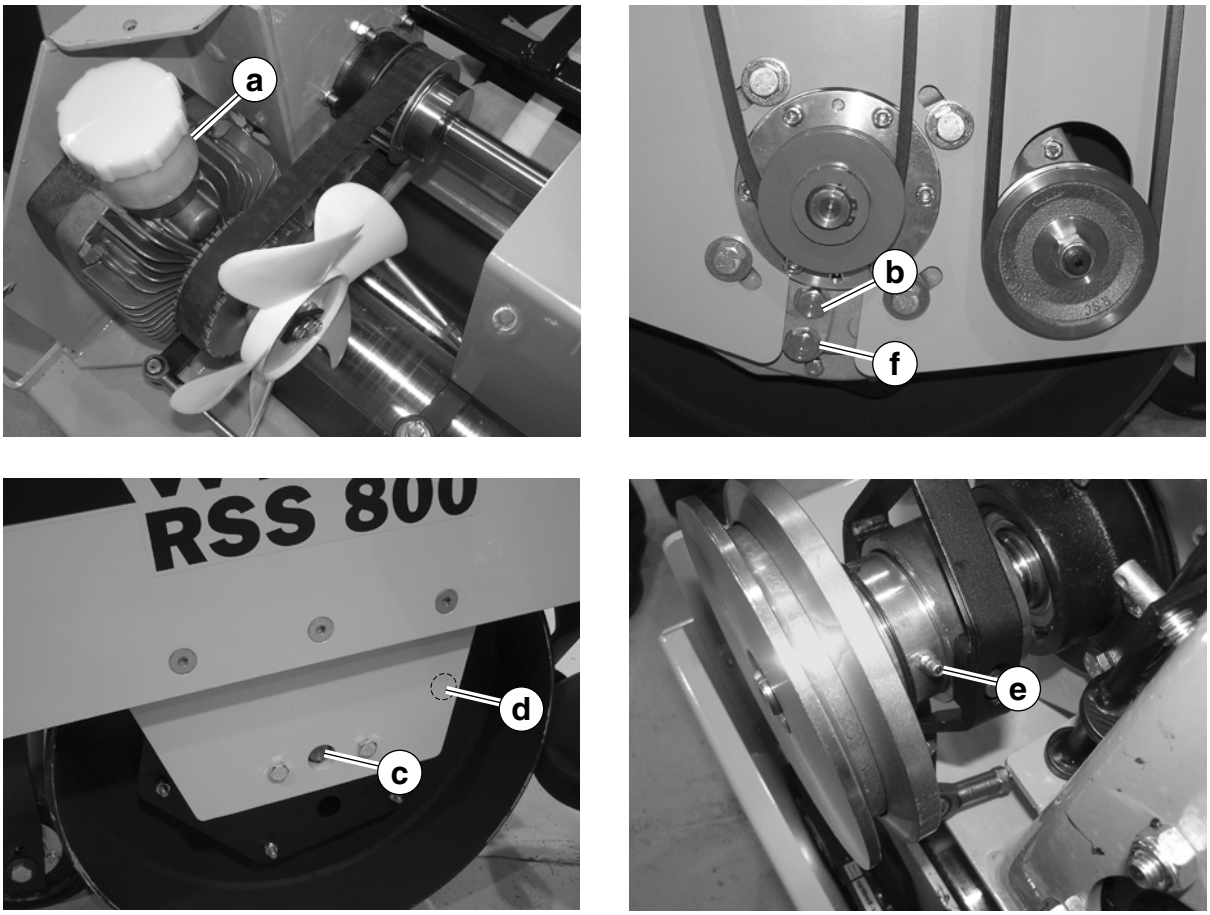
Check the oil level in the hydrostatic drive **(a)** when the machine is cold. Fill the reservoir as needed with SAE 10W-30 hydraulic oil.

Check the oil level in the gear case every 100 hours of operation. Fill the gear case with SAE 90W gear lube as needed through the fill plug **(b)**. Fill the gear case until the oil is level with the fill plug. When changing the oil, use the drain plug **(f)** to drain the oil.

Lubricate the drum bearings **(c)** every 100 hours of operation. Use a quality wheel bearing grease. Add 2–3 shots of grease with a hand-held grease gun. Do not over grease.

Lubricate the exciter bearings **(d)** every 100 hours of operation. Rotate the drum until the grease fittings are available through the holes shock mount plates. Use a quality wheel bearing grease. Add 2–3 shots of grease with a hand-held grease gun. Do not over grease.

Lubricate the clutch bearings **(e)** every 100 hours of operation. The grease fitting is located on the clutch shift collar. Use a quality wheel bearing grease. Add 2–3 shots of grease with a hand-held grease gun. Do not over grease.



wc_gr003494

5.3 Storage

If machine is to be stored for more than 30 days:

- Drain the fuel tank and the water tank.
- Open the water valve and drain water from the sprinkling system.
- Change the oil.
- Clean the entire roller and engine compartment.
- Remove the battery. Store it in a cool, dry place. Recharge the battery before using it again.
- Cover the roller and place it in a dry, protected area.
- Clean dirt from the cylinder, cylinder head fins and blower housing.
- Lock the guide handle in the upright position.

5.4 Engine Oil

See Graphic: wc_gr000022

5.4.1 Drain the oil while the engine is still warm.

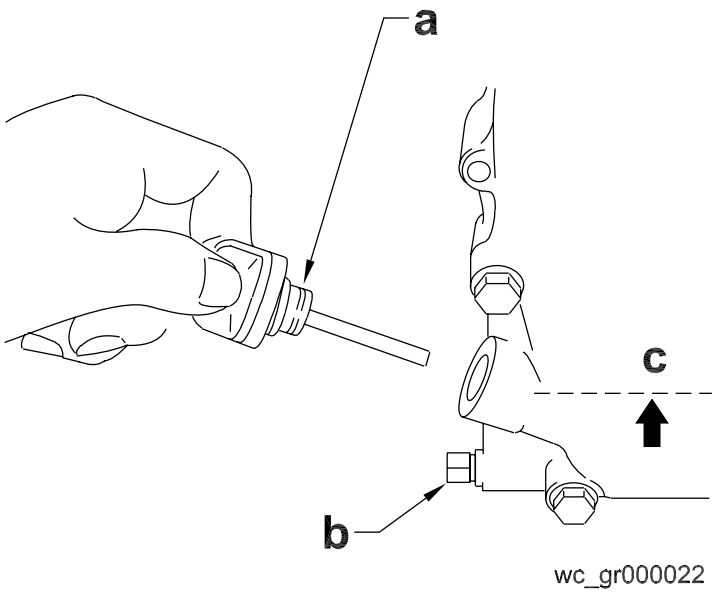
5.4.2 Remove the oil filler plug **(a)** and the drain plug **(b)** to drain the oil.

Note: *In the interests of environmental protection, place a plastic sheet and a container under the machine to collect any liquid that drains off. Dispose of this liquid in accordance with environmental protection legislation.*

5.4.3 Install the drain plug.

5.4.4 Fill the engine crankcase with the recommended oil up to the level of the plug opening **(c)**. See *Technical Data* for oil quantity and type.

5.4.5 Install the oil filler plug.



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5.5 Air Cleaner

See Graphic: wc_gr000025

The engine is equipped with a dual element air cleaner. Service air cleaner frequently to prevent carburetor malfunction.

***NOTICE*: NEVER** run engine without air cleaner. Severe engine damage will occur.

WARNING

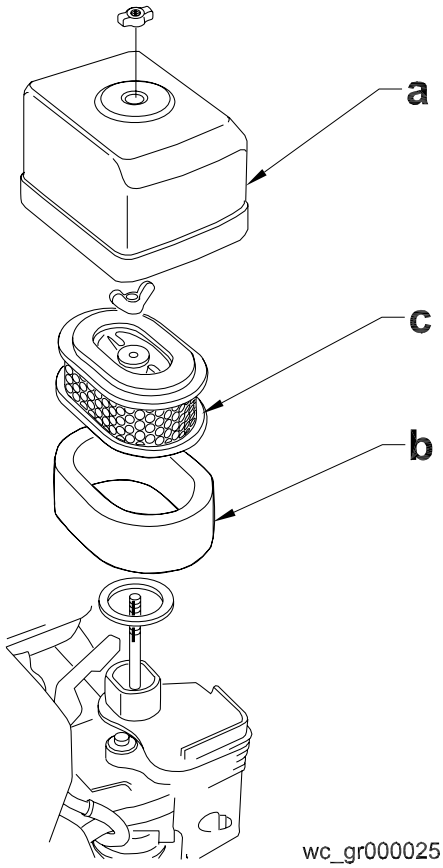
NEVER use gasoline or other types of low flash point solvents for cleaning the air cleaner. A fire or explosion could result.

To service:

5.5.1 Remove air cleaner cover **(a)**. Remove both elements and inspect them for holes or tears. Replace damaged elements.

5.5.2 Wash foam element **(b)** in solution of mild detergent and warm water. Rinse thoroughly in clean water. Allow element to dry thoroughly. Soak element in clean engine oil and squeeze out excess oil.

5.5.3 Tap paper element **(c)** lightly to remove excess dirt. Replace paper element if it appears heavily soiled.



wc_gr000025

5.6 Spark Plug

See Graphic: wc_gr000028

Clean or replace the spark plug as needed to ensure proper operation. Refer to the engine owner's manual.

WARNING

The muffler becomes very hot during operation and remains hot for a while after stopping the engine. Do not touch the muffler while it is hot.

Note: *Refer to the Technical Data for the recommended spark plug type and the electrode gap setting*.

5.6.1 Remove the spark plug and inspect it.

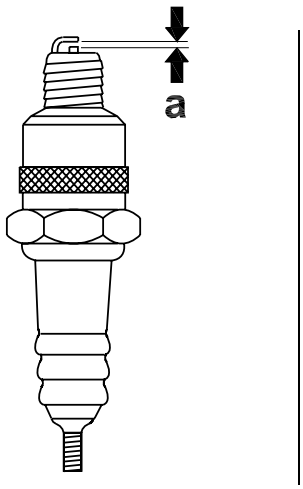
5.6.2 Replace the spark plug if the insulator is cracked or chipped.

5.6.3 Clean the spark plug electrodes with a wire brush.

5.6.4 Set the electrode gap **(a)**.

5.6.5 Tighten the spark plug securely.

***NOTICE*:** *A loose spark plug can become very hot and may cause engine damage*.



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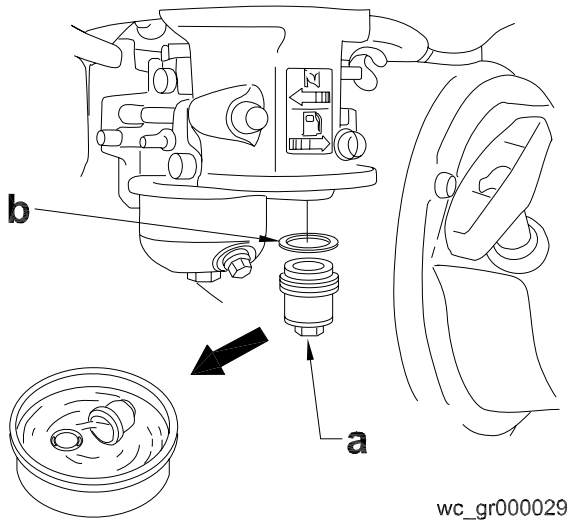


wc_gr000029

5.7 Sediment Cup

See Graphic: wc_gr000029

5.7.1 Turn the fuel valve off.

5.7.2 Remove the sediment cup **(a)** and the O-ring **(b)**.

5.7.3 Wash both thoroughly in a nonflammable solvent. Dry and reinstall them.

5.7.4 Turn the fuel valve on and check for leaks.

5.8 Carburetor

See Graphic: wc_gr000032

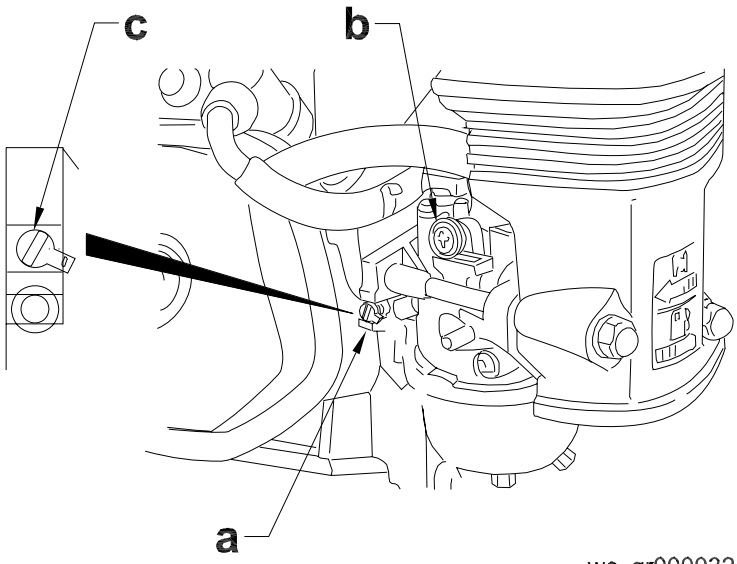
5.8.1 Start the engine and allow it to warm up to operating temperature.

5.8.2 Set the pilot screw **(a)** two turns out. See *Note*.

5.8.3 With the engine idling, turn the pilot screw **(a)** in or out to the setting that produces the highest rpm.

5.8.4 After the pilot screw is adjusted, turn the throttle stop screw **(b)** to obtain the standard idle speed. See *Technical Data*.

Note: *On some engines the pilot screw is fitted with a limiter cap* **(c)** *to prevent excessive enrichment of the air-fuel mixture in order to comply with emission regulations. The mixture is set at the factory and no adjustment should be necessary. Do not attempt to remove the limiter cap. The limiter cap cannot be removed without breaking the pilot screw.*



wc_gr000032

5.9 Scraper Bars

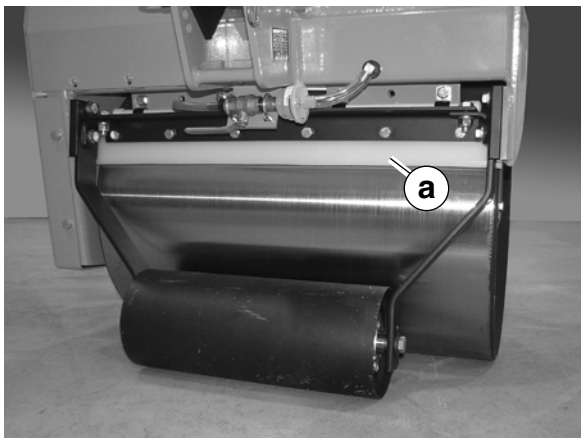
See Graphic: wc_gr003476

Check the two scraper bars **(a)** for wear. Scraper bars are made of synthetic materials which can wear very quickly when used with abrasive materials. Replace scraper bars as needed.

Cleaning the scraper bars:

The scraper bars should be cleaned daily after use or as often as needed to remove built-up dirt, mud, and tar.

Use a high-pressure water jet and a strong brush if needed.



wc_gr003476

5.10 Cleaning the Machine

When pressure washing the machine, avoid using harsh chemicals and only use moderate water pressure (500–1000 psi).

Avoid direct pressure to the following components:

- Engine
- Hoses
- Labels

5.11 Lifting the Machine

See Graphic: wc_gr001020

Attach a sling or chain to the lifting eye **(a)** using a suitable hook or shackle. Each lifting device must have capacity of at least 450 Kg (1000 lbs).

WARNING

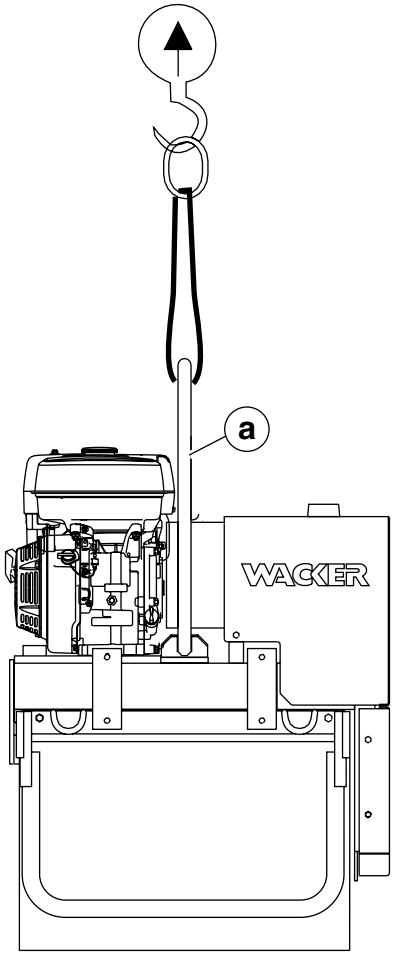
Only use steel ropes or chains for hoisting. The rope or chain must have the suitable specified lifting capacity of 450 Kg (1000 lbs). Do not use improvised ropes or chains.

CAUTION

Never use any other part of the roller to lift the machine, as severe damage may occur.

WARNING

Do not stand under, or get onto, the machine while it is being hoisted or moved.



wc_gr001020

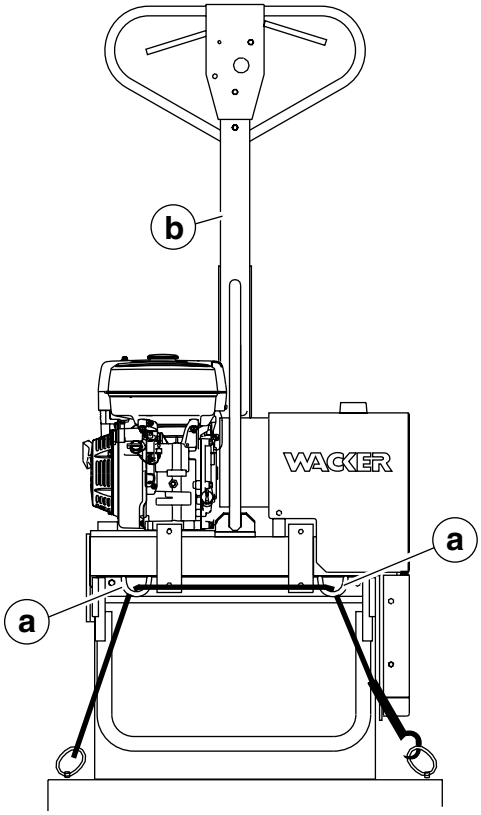
5.12 Transporting the Machine

See Graphic: wc_gr001021

Before transporting the machine, place blocks in front of and behind each drum. Use the front tie-downs **(a)** to secure the machine to the trailer. Lift handle **(b)** into upright position.

CAUTION

Never use any other part of the roller to tie the machine down, as severe damage may occur.



wc_gr001021

5.13 Troubleshooting

Problem	Cause	Remedy
Engine will not start	• No fuel	• Fill fuel tank and open fuel valves
	• No spark	• Connect spark plug and/or replace sparkplug
	• Low oil level	• Check oil alert / circuit breaker (RSS 800A). Fill engine with oil.
	• Dead battery or faulty battery connection (RSS 800A)	• Make sure battery connections are clean and tight. Charge or replace battery
Engine runs erratically	• Dirty air cleaner	• Clean air filter
	• No fuel	• Check fuel level. Open fuel valve
	• Dirty engine	• Remove deposits built-up in engine
	• Drum is obstructed	• Remove drum obstruction
Drum does not rotate	• Hydrostatic transmission not engaged	• Check/repair hydrostatic transmission release valve and camshaft
	• Drive belt loose or broken	• Tighten or replace belt
	• Hydrostatic transmission faulty	• Check transmission oil level. Fill gear case with oil
	• Control linkage disconnected or broken	• Connect or repair control linkage
	• Shaft keys sheared	• Replace shaft keys. Check function of actuator lever on transmission and drive pulleys
	• Flex coupling damaged or slipping	• Check set screws on flex coupling. Replace flex coupling

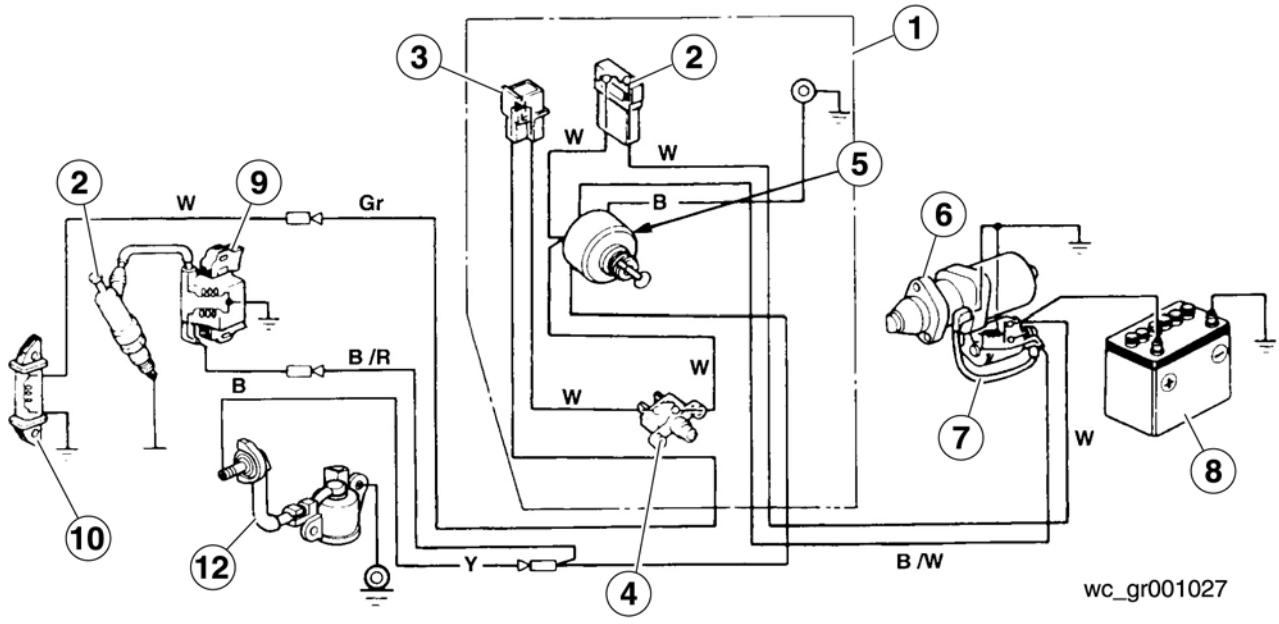
Problem	Cause	Remedy
Drum does not vibrate	• Exciter belt loose • Exciter belt broken • Clutch adjusted incorrectly • Control linkage disconnected or broken	• Adjust idler pulley • Replace exciter belt • Correct clutch adjustment • Connect or repair linkage
Drum does not return to neutral	• Neutral position on transmission not set • Centering spring in handle installed incorrectly	• Adjust neutral position on transmission • Correct installation of centering spring
Roller operates erratically	• Clutch worn • Incorrect belt tension • Faulty pulley mounts • Faulty linkages • Exciter bearings binding • Gear case bearings binding or gears jammed • Hydrostatic transmission faulty • Scraper bars folded under frame	• Check clutch for wear, damage, or loose fasteners. • Check belt tension. Replace worn or damaged belts. • Tighten set screws and other mounting hardware. • Check controls, linkages, and connections • Grease or replace exciter bearings • Rebuild gear case • Check transmission oil level and temperature. • Clean drum surface and adjust scraper bar tension

5.14 Wiring Diagram (RSS 800A)

See Graphic: wc_gr001027

Ref.	Description	Ref.	Description
1	Control box	7	Starter solenoid
2	5 Amp fuse	8	Battery
3	Rectifier	9	Ignition
4	Circuit breaker	10	Charging coil
5	Starter switch	11	Spark plug
6	Starter motor	12	Oil level switch

Wire Colors							
B	Black	R	Red	Y	Yellow	Or	Orange
G	Green	T	Tan	Br	Brown	Pr	Purple
L	Blue	V	Violet	Cl	Clear	Sh	Shield
P	Pink	W	White	Gr	Gray	LL	Light blue



ROLLER COMPACTOR

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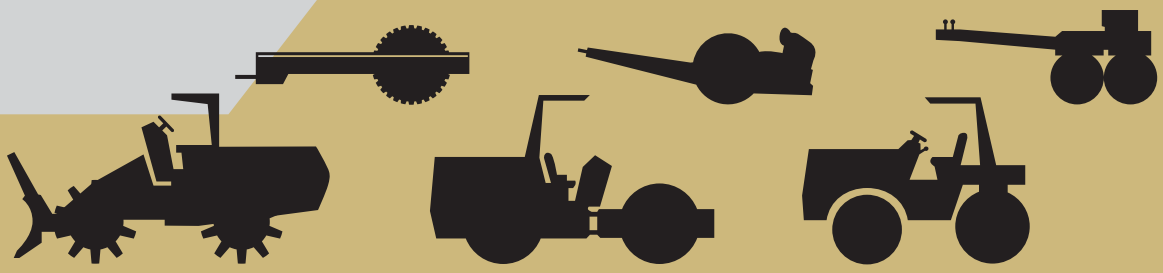
SAFETY MANUAL

FOR OPERATING AND MAINTENANCE PERSONNEL



SAFETY ALERT SYMBOL

This Safety Alert Symbol means ATTENTION is involved!

The Safety Alert Symbol identifies important safety messages on machines, safety signs, in manuals, or elsewhere. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to YOU?

3 BIG REASONS:

- **Accidents KILL or DISABLE**
- **Accidents COST**
- **Accidents CAN BE AVOIDED**

Revised 6/02, 9/04

WORD OF EXPLANATION

The following is a partial list of reference material on safe operating practices:

U.S. Department of Labor publishes safety and health regulations and standards under the authority of the Occupational Safety and Health Act for the general construction and mining industries. Its address is: U.S. Department of Labor, 200 Constitution Avenue, NW, Washington, DC 20210.

SAE - Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096, publishes a list, "Operator Precautions," SAE J153 MAY, 1987.

Association of Equipment Manufacturers, 111 East Wisconsin Avenue, Milwaukee, WI USA 53202, publishes the Roller Compactor Safety Manual and other safety-related material.

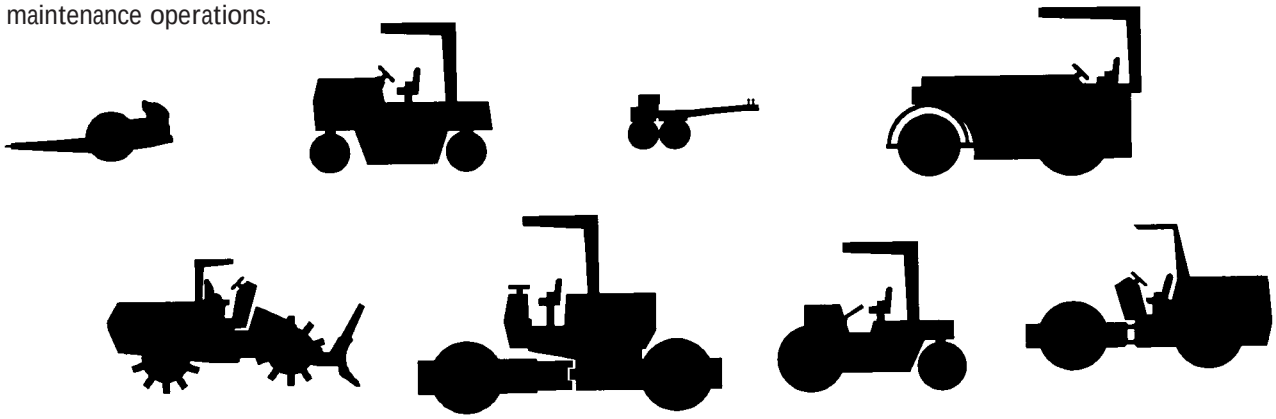
This Safety Manual covers many different types of roller compactors … including steel wheel rollers, vibratory rollers, rubber-tired rollers, segmented pad/sheepsfoot soil compactors and landfill compactors. These may be either self-propelled ride-on, walk-behind or towed rollers. They may be used for the compaction of asphalt, soil, landfill or other materials. Excluded from coverage are vibratory plates and hand rammers.

Regardless of which machine you operate, it is YOUR responsibility to study and understand this Safety Manual, and to see that a copy remains with your machine. The manual begins with your "safety homework," takes you step-by-step through your working day, and ends with maintenance operations.

Manufacturers produce machines with many built-in safety features. Employers provide accident prevention programs. Yet, the ultimate responsibility to operate and maintain your machine with the skill, care and knowledge essential for safety is YOURS.

Do not operate your machine until you have been trained in the use of all operating controls and understand the handling characteristics of the machine.

REMEMBER — SAFETY … YOURS AND THAT OF THOSE AROUND YOU … IS UP TO YOU!



FOREWORD

This safety manual is intended to point out some of the basic situations which may be encountered during the normal operation and maintenance of your machine, and to suggest possible ways of dealing with these conditions.

Additional precautions may be necessary, depending on application, machine type, configuration and attachments used, and conditions at the work-site or in the maintenance area. The manufacturer has no direct control over machine application, operation, inspection, lubrication or maintenance. Therefore, it is your responsibility to use good safe practices in these areas.

The information provided in this manual supplements the specific information about your machine that is contained in the manufacturer's manual(s). Other information which may affect the safe operation of your machine may be contained on safety signs, or in insurance requirements, employer's safety programs, safety codes, local, state/provincial and federal laws, rules and regulations.

If you do not understand any of this information, or if errors or contradictions seem to exist, consult with your supervisor before operating your machine.

IMPORTANT: If you do not have the manufacturer's manual(s) for your particular machine, get a replacement manual from your employer, equipment dealer, or manufacturer of your machine. Keep this safety manual and the manufacturer's manual(s) with your machine.

Unauthorized modifications of machines create hazards. Machines should not be modified or altered unless prior approval is obtained from the manufacturer.

It is your responsibility to read and understand this safety manual and the manufacturer's manual(s) before operating your machine. This safety manual takes you step-by-step through your working day.

Remember that **YOU are the key to safety.** Good safety practices not only protect you but also protect the people around you. Study this manual and the manufacturer's manual(s) for your specific machine. Make them a working part of your safety program. Keep in mind that this safety manual is written for only this type of machine. Practice all other usual and customary safe working precautions, and above all — (FIG. 1)

REMEMBER — SAFETY IS UP TO YOU

YOU CAN PREVENT SERIOUS INJURY OR DEATH

FIG. 1

FOLLOW A SAFETY PROGRAM

KNOW THE RULES

Every employer is concerned about safety. Safe operation and proper maintenance of your machine can prevent accidents. KNOW the rules — LIVE by them. (FIG. 2)

When starting work at a new site, check with the designated safety coordinator for specific safety instructions. DON'T LEARN SAFETY THE HARD WAY.

Know the meaning of all hand signals, signal flags, signs and markings.

Know the traffic rules used at the work site. Know who the signal person is; watch and obey their signals.

Know where the fire extinguishers and first aid kits are kept and how to use them. Know where to get proper aid and assistance when needed.

Use common sense to avoid accidents. If an accident does occur, be prepared to react to it quickly and effectively. NEVER PANIC.

Know how to use the emergency communications system to summon help when necessary.

FIG. 2

KNOW WHAT IT IS?

Consult your supervisor for specific instructions on a job, and the personal safety equipment required. For instance, you may need:

- Hard Hat
- Safety Shoes
- Eye Protection
- Face Protection
- Heavy Gloves
- Reflector Vests
- Hearing Protection
- Respirators

Do not wear loose clothing or any accessory — flopping cuffs, untied shoelaces, dangling neckties and scarves, rings, wrist watches, or other jewelry — that can catch on protruding or moving parts or controls. Long hair should be securely bound to prevent entanglement with moving parts. (FIG. 3)

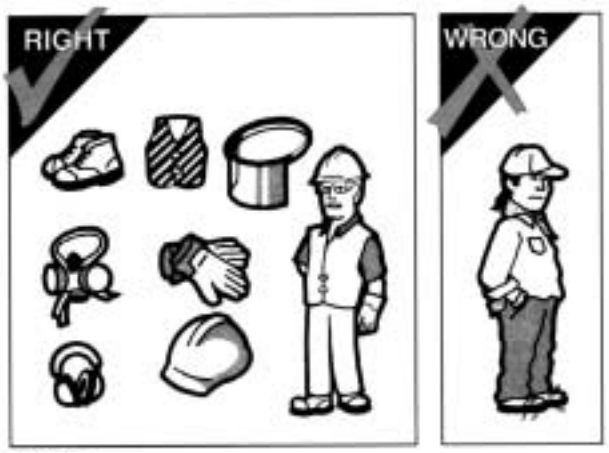


FIG. 3

FOLLOW A SAFETY PROGRAM

BE ALERT!

Know where to get assistance. Know how to use a first aid kit and fire extinguisher or fire suppression system. (FIG. 4)

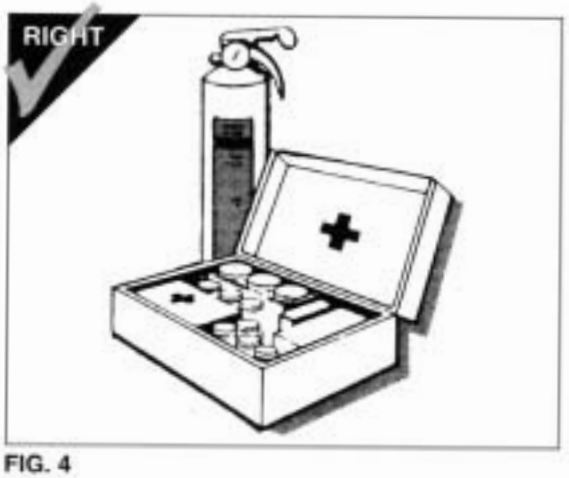


FIG. 4

BE AWARE!

Take advantage of training programs offered.

Safety programs require that one person at each jobsite be assigned the overall responsibility and authority for safety. Know who that person is, and COMMUNICATE.

Know what the jobsite rules are, and FOLLOW THE RULES. Be safety conscious, responsible and reliable. Think about safety BEFORE something happens.

Report unsafe conditions to a supervisor immediately!

BE CAREFUL!

Human error is caused by many factors: carelessness, fatigue, overload, preoccupation, incompatibility between operator and the machine, drugs, and alcohol to name a few. Eliminate these factors BEFORE accidents occur. Damage to the machine can be fixed in a short period of time, but injury, or death has a lasting effect.

FOR YOUR SAFETY AND SAFETY OF OTHERS, ENCOURAGE YOUR FELLOW WORKERS TO ACT SAFELY.

LEARN TO BE SAFE

READ the operator's manual. If one has not been provided, GET ONE AND STUDY IT BEFORE OPERATING THE MACHINE. If you have any questions contact the manufacturer.

Know the positions and understand the functions of all controls before attempting to operate a machine. Know the meaning of all identification symbols on your controls and gauges. (FIG. 5)

Know the location of the emergency shut-down control if the machine is so equipped.

Know the capabilities and limitations of the machine … such as speed, breaking and steering.

Know the operational and transport dimensions of your machine to avoid inadvertently hitting something during operation or transporting.

Carefully read and follow the instructions on all safety signs on the machine. Keep safety signs in good condition. Replace missing or damaged safety signs.

FIG. 5

NEVER operate a machine which is new to you without first being instructed in its proper operation.

CHECK IT OUT!

Always conduct a pre-shift inspection before operating any machine. Know what safety devices your machine is equipped with … and see that each item is securely in place and in operating condition. (FIG. 6)

For example:

- Safety Blocks and Locks
- Other Locking Devices
- Lights
- Alarms
- Horn
- Guards and Shields
- Shut-Down Devices
- First Aid Kit
- Fire Extinguishers

FIG. 6

PREPARE FOR SAFE OPERATION

TIRES

Inspect pneumatic tires (if so equipped) for damage, wear, and proper inflation. Never operate with over-inflated or under-inflated tires. (FIG. 7)

Check that all wheel lug nuts are present and tight.

NEVER START OR OPERATE A MACHINE KNOWN OR SUSPECTED TO BE DEFECTIVE OR MALFUNCTIONING.

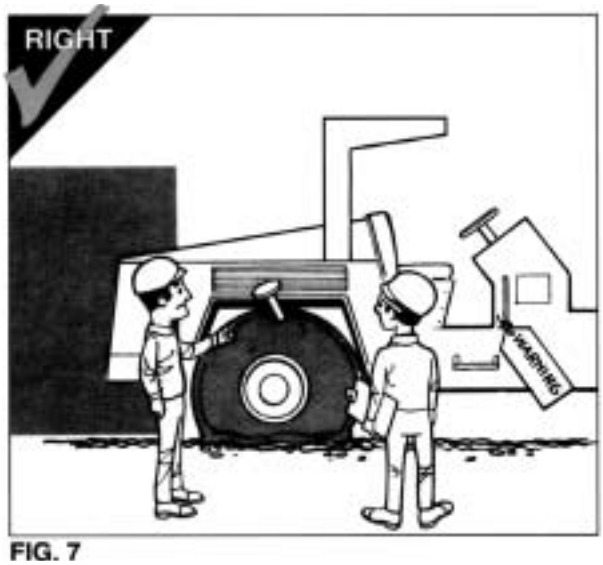


FIG. 7

KNOW YOUR MACHINE

Never operate a machine for which you are not trained or qualified.

Familiarize yourself with pedals, controls and instruments – their locations and function.

To handle controls without slipping, wipe them clean of oil and grease.

Remove tools, supplies and other materials from the working areas and machine walkways – and keep these areas free of trash.

Make sure the items you do carry are not loose or in the way.

ARE REPAIRS MADE?

If your daily check uncovers any item that needs attention – repair, replacement, or adjustment – report it to your supervisor and tag the machine on the start switch and/or other appropriate, prominent location. A minor malfunction could be a sign of a more serious problem if the machine is operated.

FIRE PREVENTION

Never allow flammable fluids or materials to contact hot surfaces.

Never refuel:

- When engine is running
- While smoking
- Near open flames or sparks
- In poorly ventilated area

Never overfill fuel tank or fluid reservoirs. Clean up spills immediately.

Replace fuel cap securely after filling.

Check for fuel, oil and hydraulic fluid leaks. Replace worn or damaged hoses/tubes. After repairs are made, clean the machine before you operate it.

Inspect electrical wiring for worn or damaged insulation. Install new wiring if wires are damaged.

Because ether or other starting fluids are flammable, do not smoke when using them. Always follow the instructions on the container and in the operator's manual for your machine. (See page 19.)

Batteries produce explosive gases. Keep open flame or sparks away. See the manufacturer's instructions when servicing the batteries, when using jumper cables or when using a battery charger. (See pages 36 and 37.)

Remove all trash or debris from the machine. Make sure that oily rags or other flammable material are not stored on the machine. (FIG. 8)

FIG. 8

PREPARE FOR SAFE OPERATION

PREPARING TO ROAD THE MACHINE

Know what conditions you will likely encounter:

- Insufficient clearances
- Traffic congestion
- Type of surface
- Steep grades
- Restricted visibility

Determine appropriate warnings to be used. (FIG. 9) Know whether you will need to be escorted.

If the machine is to travel on a road or highway, refer to the manufacturer's manual(s) for instructions. Become familiar with local laws and ordinances affecting driving on highways. Use "slow moving vehicle" emblem. Make sure flags, lights, and warning signs are in place.

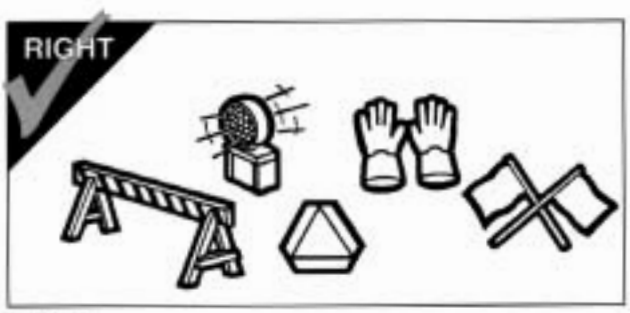


FIG. 9

Select the proper gear before negotiating steep grades. (FIG. 10)

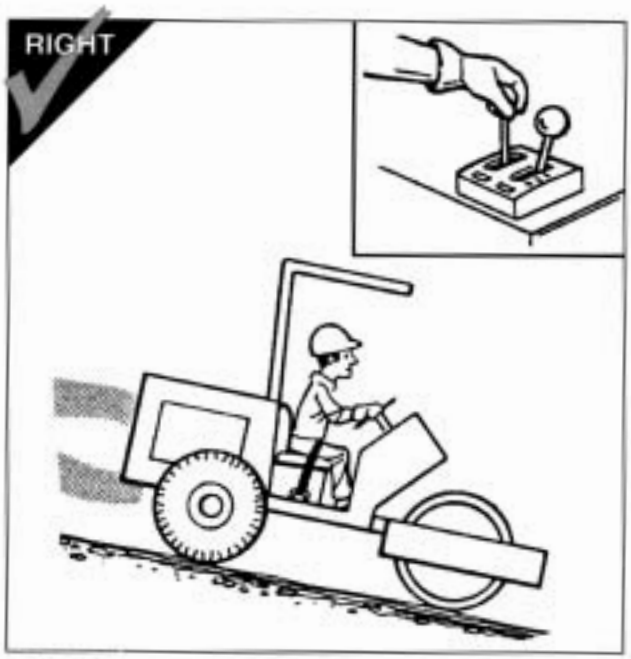


FIG. 10

Before starting, carefully inspect your machine for any evidence of physical damage such as cracking, bending or deformation of plates or welds. Check for cracking or flaking of paint, which may indicate an excessive strain or dangerous crack in the material below. Check for loose, broken or missing parts such as Roll-Over Protective Structure (ROPS) support brackets, vibration isolators, and nuts and bolts. If potentially serious problems are found, do not operate the machine until appropriate repairs are completed.

Check the level of all fluids … brake, transmission, power steering, engine coolant, hydraulic system, and others. Fill low reservoirs only to the proper level.

Check the various systems (hydraulic, cooling, etc.) for leaks. (FIG. 11) Inspect all plugs, filler caps and fittings for tell-tale signs of leaks. ALWAYS use a flashlight or shielded trouble light when checking … Never an open flame. Repair any leaks, or have them repaired by authorized service personnel. (See pages 28 through 42 for additional service cautions.)

Check the fuel level and, if low, fill the tank with the proper grade of clean fuel before extended operation (following the instructions on page 34).

A stalled or faltering engine can result in a real hazard when operating on grades, in traffic or in heavily congested areas.

NEVER smoke when checking fuel level or refueling.

FIG. 11

BE SURE THE WORK AREA IS SAFE

Before beginning operation, thoroughly check the area for any unusual conditions that could be dangerous. (FIG. 12) Check for hidden holes, drop-offs or overhead obstacles that could be dangerous. Check the clearance under overhead power and phone lines. LOOK UP AS WELL AS DOWN.

Be observant of other workmen, bystanders and other machines in the area. Be especially careful if trenches, lightpoles, tiles, buildings, etc. are within the effective range of a vibratory compactor. IMPROPER OPERATION COULD RESULT IN DAMAGE OR INJURY.

Remember, the danger of sliding and/or tipping on steep slopes is always present … regardless of how heavy or "stable" your machine may appear to be. When operating under these conditions, the use of ROPS and seat belts reduces the hazard to operating personnel.

FIG. 12

Walk around your machine once more just prior to mounting it – checking for people and objects that might be in the way – then MOUNT PROPERLY USING STEPS AND HANDHOLDS PROVIDED.

Always use seat belts if your machine is equipped with a ROPS.

Just before starting, check all controls … such as forward and reverse, steering, transmission and throttle to be sure they are in the correct start-up position. (FIG. 13) The parking brake should be applied during the start-up operation.

Check for proper functioning of all operating and shut-down controls.

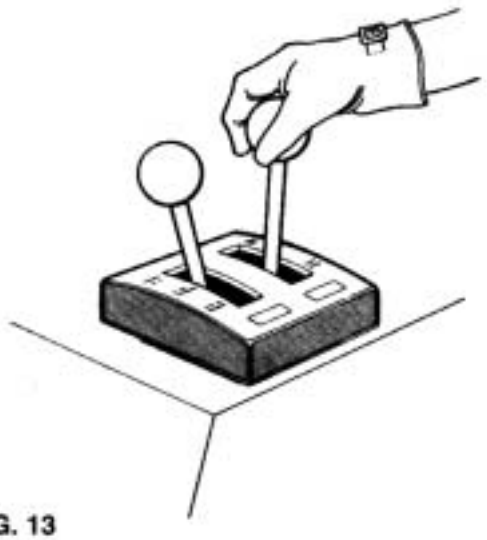


FIG. 13

START CORRECTLY

Know the PROPER starting procedure for your machine. Follow the manufacturer's operation manual … to the letter.

Then, start your engine.

IMMEDIATELY AFTER STARTING THE ENGINE ...

- Observe gauges, instruments, and warning lights to ensure that they are functioning and their readings are within the normal operating range. (FIG. 14)
- Be sure work area is safe for test operation of the various controls and attachments.
- Operate all controls: make certain they operate properly, and "feel" right. Accustom yourself to the "feel" of your machine.
- Listen for any unusual noises; smell for any unusual odors; look for any signs of trouble.
- Check all warning and safety devices and indicators.
- If safety-related defects or malfunctions are detected, shut down the machine. Correct it, or notify your supervisor. DO NOT OPERATE UNTIL CORRECTED.

Check operation of service and parking brakes on level ground if possible.

Check service brakes (including hydrostatic brakes, if so equipped) in both forward and reverse operation (FIG. 15) ACCORDING TO THE MANUFACTURERS INSTRUCTIONS.

If an unsafe condition cannot be remedied immediately, notify your supervisor and tag the machine on the start switch and/or other appropriate, prominent location. (See page 28 for Lockout/Tagout procedure.) No machine should be operated if any part is not in safe operating condition. Make certain that any unsafe condition has been satisfactorily remedied.

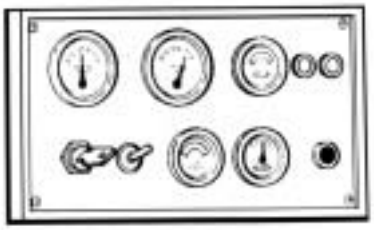


FIG. 14

FIG. 15

COLD WEATHER OPERATION

Consult the engine manufacturer's operation manual for proper cold weather starting procedure.

When using cold weather starting aids, be sure to follow the engine manufacturer's instructions. (FIG. 16)

After starting, operate all systems slowly and gently until properly warmed up.

FIG. 16

BOOSTER CABLE INSTRUCTIONS

1. Connect positive (+) cable to positive post of discharged battery.
2. Connect other end of same cable to same marked post of booster battery.
3. Connect negative (-) cable to other post of booster battery.
4. Make final connection on stalled vehicle away from battery, either on vehicle frame or engine block.
5. Start vehicle and remove cables in reverse order of connection.

WORK SAFELY

REMEMBER THESE RULES

When roading or operating a machine, always stay in the operator's station. NEVER mount or dismount a machine that is moving. Maintain control of your machine at all times.

ALWAYS operate your machine slowly until fully familiarized with it's operation.

Constantly check your total work area for potential hazards.

Never JUMP on or off your machine. Use the steps and handholds provided to mount or dismount safely. Maintain three point contact when mounting or dismounting.(FIG. 17)

- Never use controls or levers as hand holds.
- Never jump off the machine.

Look, listen and smell for possible malfunctions. If malfunctioning controls or erratic operation are detected, correct or report them immediately. DO NOT OPERATE THE MACHINE UNTIL CORRECTED.

Prevent asphyxiation. If you must operate in a building or other enclosed area, or if your machine is equipped with an enclosed cab, be certain there is adequate ventilation.

Use extra care when refueling. (See page 34 for special precautions.)

FIG. 17

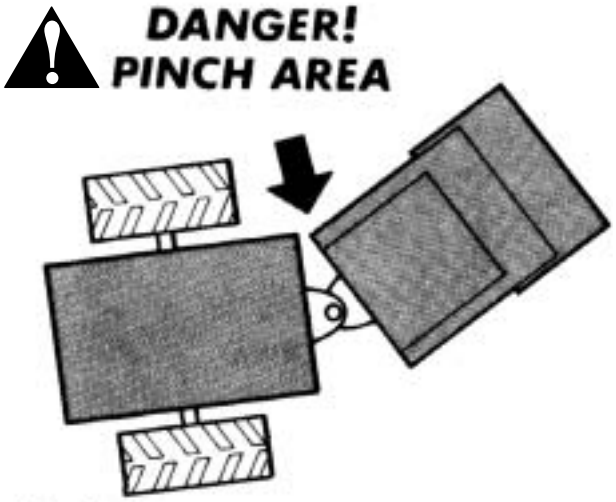


FIG. 18

For maximum safety on machines with more than one operator's position, operate from the position giving the greatest visibility of potential hazards.

NEVER allow unqualified or unauthorized personnel to operate your machine.

NEVER allow other personnel to ride on your machine unless appropriate seating is provided … and then only if authorized to do so.

NEVER abuse your machine. Misuse or abuse can cause an accident.

NEVER enter or place any part of your body in the "hinge area" or other "pinch" areas of an articulated machine while the engine is running, or when there is any chance another person might start the machine. (FIG. 18)

Give the right-of-way to loaded equipment on haul roads. Maintain a safe distance from personnel, motor vehicles and other machines.

Your safety, and the safety of those around you, is determined by the care and judgment YOU use while operating your machine.

WORKING ON SLOPES

When working on slopes, avoid sidehill travel whenever possible … rather operate up and down the slope. (FIG. 19 & 20) Remember the danger of sliding and/or tipping on steep slopes is always present … regardless of how heavy or "stable" your machine may appear to be.

ALWAYS use seat belts IF your machine is equipped with a ROPS.

NEVER allow the engine or machine to overspeed.

When climbing or descending steep grades, ALWAYS select the proper gear BEFORE starting on the slope, to assure adequate power or engine breaking.

If your machine has a gear shift, select a low gear. If your machine has a hydrostatic drive, the speed control should be in the slow travel position, close to neutral … NEVER in the fully displaced position.

On machines that have a gear shift AND a hydrostatic control, BOTH controls must be in their slow travel position.

ALWAYS be sure that manually operated gear type transmissions are fully engaged BEFORE starting onto a grade. DO NOT attempt to change the gear selection while traveling on a grade. See the manufacturer's manual for specific instructions.

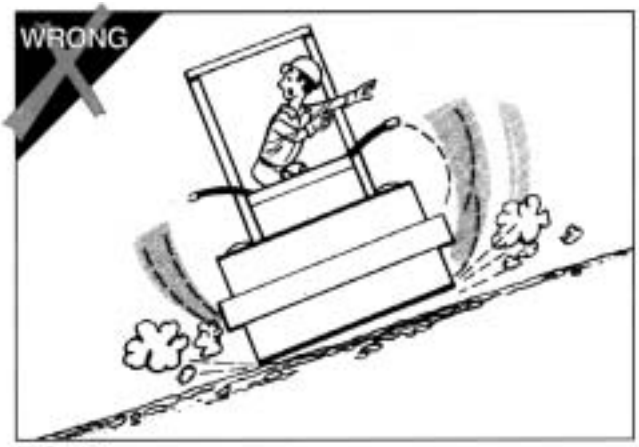


FIG. 19

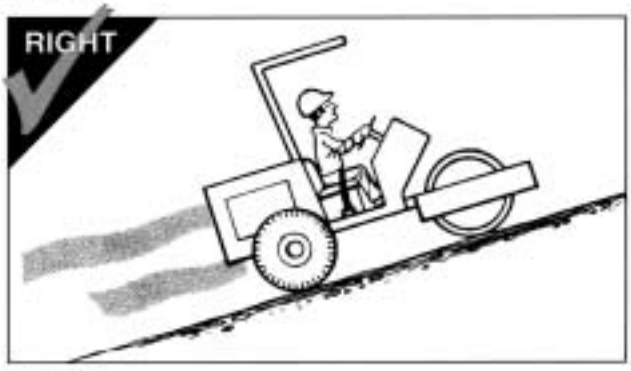


FIG. 20

FIG. 21

Avoid operating your machine too close to an overhang, deep ditch or hole. If your machine inadvertently gets close to a tipping condition or drop-off, STOP and get off the machine after applying the parking brake … plan your moves carefully before proceeding. Reversal is often the best move.

Be alert to potential caving edges, falling rocks and slides.

Check for overhead obstacles that could be dangerous. LOOK UP AS WELL AS DOWN. (FIG. 21)

Be alert to obstacles and excessively rough terrain. Back away from them and go around.

Always travel slowly over rough terrain and hillsides. Maintain a speed consistent with the working conditions.

When traveling on a public road, obey all traffic regulations and be sure that the proper clearance flags, lights and warning signs … such as the "slow moving vehicle" emblem … are used. (FIG. 22)

NEVER speed … and NEVER coast in neutral.

When roading the machine know your approximate stopping distance at any given speed.

NEVER turn corners at excessively high speeds. (FIG. 23)

Always look in all directions before reversing your direction of travel.

Use EXTRA caution when working in close quarters or when traveling through congested areas. Courtesy pays off.

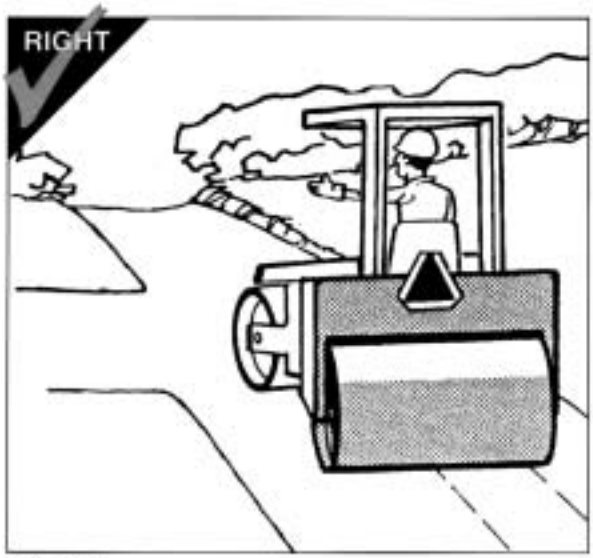


FIG. 22

FIG. 23

PARK SAFELY

Park in an off the road area, out of traffic, or as instructed. If necessary to park in a traffic lane, use the appropriate flags, barriers, flares, lights and warning signals. Provide advance warning signals in the traffic lane to warn approaching traffic.

Park on level ground whenever possible. (FIG. 25) When not possible, position the machine at right angles to the slope. Make sure the machine is on a firm footing, and that there is no danger of sliding. Do NOT leave your machine until you are sure it is safely blocked in both directions and parking brakes firmly applied. (FIG. 24)

Lower the blade and all other hydraulically operated attachments (if so equipped) to the ground.

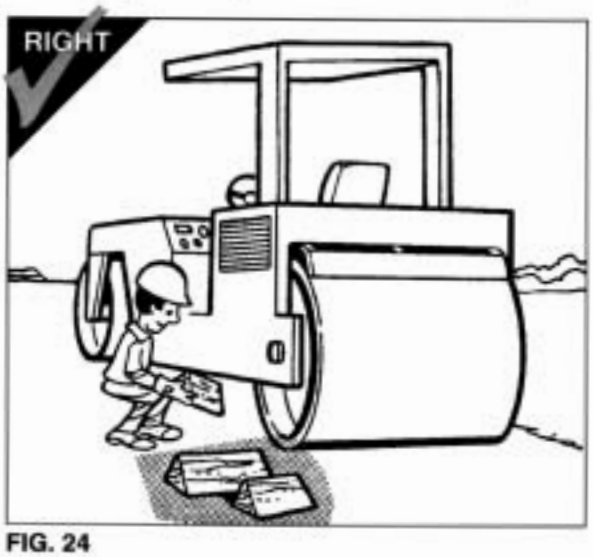


FIG. 24

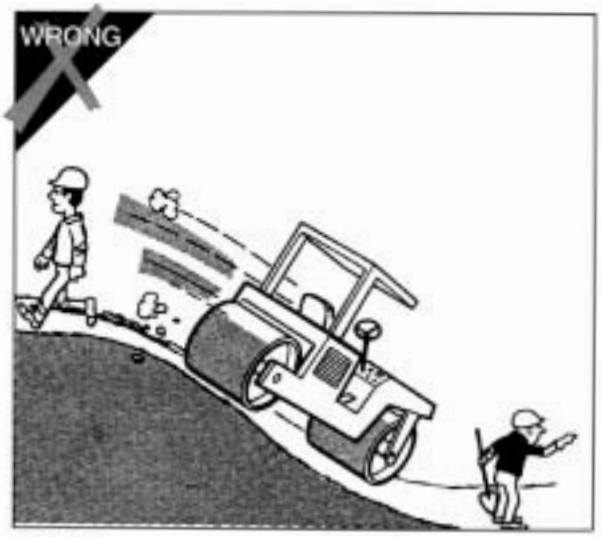


FIG. 25

PARK AND SHUT DOWN SAFELY

SHUT DOWN PROPERLY

Know the proper shut-down procedure for your machine. As with the starting procedure, this varies with the type and model of machine.

Follow the manufacturer's operation manual for YOUR machine. Remove the key(s) to prevent unauthorized starting and movement, and position and lock any antivandalism devices.

DISMOUNT PROPERLY

NEVER dismount from your machine until it is fully stopped and the engine is shut off.

NEVER jump off your machine. (FIG. 26) After stopping, use the steps and handholds provided to dismount safely. Maintain three point contact when dismounting.

FIG. 26

Loading and unloading machines always involves potential hazards. EXTREME CAUTION SHOULD BE USED.

Know the correct loading and unloading procedures for your machine.

All machines are not loaded and unloaded the same way. The procedures recommended by the manufacturer should always be followed.

Several precautions are applicable to all machines:

- NEVER load or unload machine by yourself.
- Keep all non-essential personnel clear of loading and unloading area.
- Load and unload on a level surface.
- ALWAYS use ramps of adequate size and strength. Be sure ramps are sufficiently wide, and long enough to provide a safe loading slope.
- NEVER use ramps that are cracked, damaged, or of questionable strength. (FIG. 27)
- Be sure that the ramps are securely positioned and fastened, and that the two sides are at the same level as one another.
- The ramp surface must provide adequate traction. Be sure the surface is clean and free of grease, oil, ice, and loose material.
- The hauling vehicle should be blocked to prevent movement during loading or unloading of the machine.
- For proper tie-down instructions, see the manufacturer's manual.

FIG. 27

TRANSPORTING SAFELY

GENERAL

When towing a machine on a trailer, or a machine equipped with "portability or transport wheels", ALWAYS use a hauling vehicle of sufficient weight, horsepower and braking capacity to maintain proper control.

NEVER attempt to tow a trailer or machine if the hitching devices are of insufficient or questionable capacity, improperly matched in size or shape, or positioned at improper heights.

When towing a machine equipped with portability or transport wheels, ALWAYS follow the manufacturer's towing instructions.

BEFORE TOWING

When connecting a trailer to a hauling vehicle, block under the trailer's tongue before attempting to make the connection. NEVER attempt to lift heavy tongues or move heavy trailers by hand. NEVER get any part of your body under the tongue when hitching or unhitching.

ALWAYS make sure the hitch is properly and securely locked.

ALWAYS use safety chains between the hauling vehicle and tailer or towed machine. Be sure the chains are properly and securely connected … at BOTH ends. Cross the chains under the tongue when connecting to the hauling vehicle.

ALWAYS make sure electrical and other connections between the hauling vehicle and trailer or towed machine are properly and securely made. After connecting, check the lights for proper operation. If the towed trailer or machine is equipped with brakes operable from the hauling vehicle, check to make sure they are operating properly.

ALWAYS be sure the portability or transport wheels, on machines so equipped, are LOCKED in the lowered position.

Check ALL tires for proper pressure, excessive or abnormal wear, and potentially dangerous cuts, bruises or bulges. Have any problems corrected before proceeding.

TOWING

ALWAYS use EXTRA care when towing a trailer or machine… when maneuvering in tight places, when backing (visibility is reduced, and jackknifing must be avoided), and when towing on steep grades.

Know and obey all local, state and federal laws and regulations.

NEVER travel at speeds above those recommended by the manufacturer.

NEVER allow anyone to ride on a trailer or towed machine. (FIG. 28)

When necessary to disconnect and park a trailer or towed machine, ALWAYS select a location that is level and, if possible, one where children are unlikely to be present. BEFORE disconnecting a trailer, chock the front AND rear of the wheels, and block under the tongue.

See pages 23 through 24 for parking, shut-down procedures and roading machine for transport.

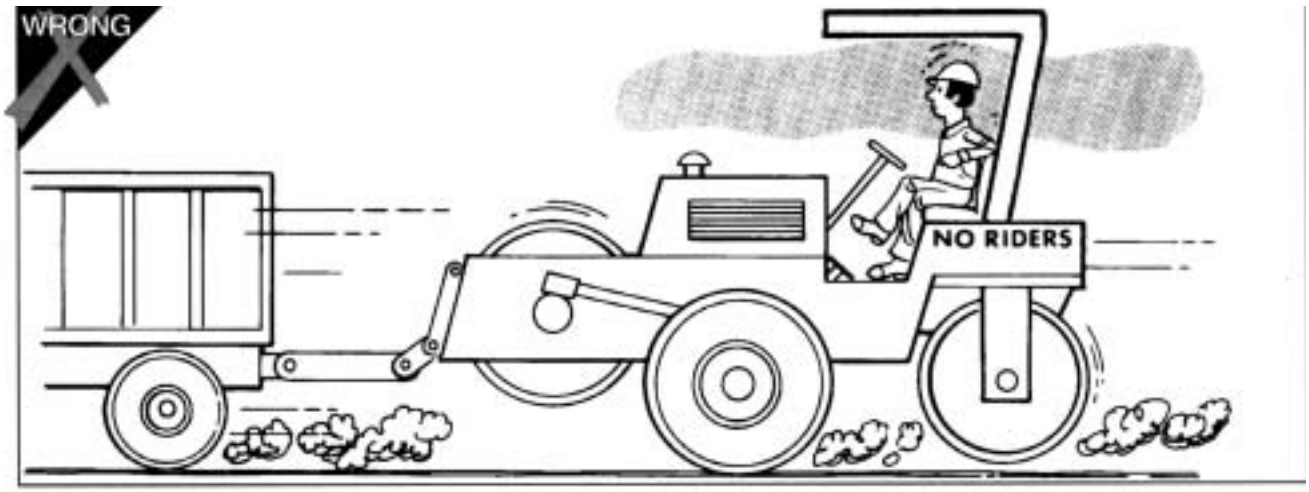


FIG. 28

PERFORM MAINTENANCE SAFELY

GENERAL

Maintenance work can be **hazardous** if not done in a careful manner. All personnel should realize the hazards and strictly follow safe practices.

NEVER perform any work on the equipment unless authorized to do so. (FIG. 29) Before performing any maintenance or repair work, consult the Instruction Manual. Follow the manufacturer's recommended procedures.

BEFORE any maintenance work is begun, review LOCKOUT/TAGOUT procedures. LOCKOUT controls and/or energy source and place a warning label to alert workers of shutdown.

PRIOR to removal of LOCKOUT/TAGOUT, the equipment must be fully operational and all personnel accounted for. Except in cases of emergency, the removal of the LOCKOUT/ TAGOUT should be done by the initiating person prior to the return to start-up.

BEFORE doing any major work, or work on the electrical system, disconnect the batteries.

REPLACE all missing or broken guards and panels.

USE proper nonflammable cleaning solvents. Follow solvent manufacturer's instructions.

ALWAYS remove all flammable materials in the vicinity of welding and/or burning operations.

BURNING OR WELDING in the vicinity of acoustical material may release hazardous fumes.

FIG. 29

CLOTHING AND PERSONAL PROTECTIVE ITEMS

Keep hands and clothing well away from engine fan and moving parts while engine is running.

ALWAYS wear appropriate safety glasses, goggles or face shield when working. (FIG. 30) Proper eye protection can keep flying particles from grinding, drilling or hammering operations, or fluids such as fuel, solvents, lubricants and brake fluids, from damaging your eyes. Normal glasses do NOT provide adequate protection.

ALWAYS wear a hard hat and safety shoes. (FIG. 30) ALWAYS wear hearing protectors when exposed to high noise levels for extended periods. ALWAYS wear a respirator when painting or exposed to dusty conditions. ALWAYS keep your pockets free of loose objects which can fall out and drop into machinery. (FIG. 31) Heavy gloves should be worn for many operations.

FIG. 30

FIG. 31

EXHAUST FUMES

Engine exhaust fumes can cause sickness or death. If it is necessary to run an engine in an enclosed area, use an exhaust pipe extension. If you do not have an exhaust pipe extension, be positive the area is adequately ventilated. (FIG. 32)

FIG. 32

HEAVY PARTS

Handle tools and heavy parts sensibly – with regard for yourself and other persons. Lower items – don't throw or drop them.

ALWAYS use proper hoisting equipment for lifting heavy loads.

PERFORM MAINTENANCE SAFELY

- Keep machine in proper adjustment at all times. Serious injury could result if adjustments are neglected.
- Whenever possible, AVOID working on a machine with the engine running. If the engine must be run to make checks or adjustments, put the transmission in neutral, set the parking brake and chock the drum and wheels securely ... front and rear ... to prevent movement in either direction.
- Personnel can be caught by moving parts when the **guards are removed** for access in making repairs. A repair or maintenance job is not complete until guards, plates and other safety devices have been replaced.
- NEVER put your fingers in open gears or reach through the spokes of a gear.
- Before working on the fuel system, close the fuel shut-off valve. NEVER smoke or use open flames near the machine while working on the fuel system.
- **Remove and store** all tools before resuming operation.
- Before working in the pivot or "pinch" area of an articulated machine, securely attach the steering frame lock to prevent the machine from turning. (FIG. 33) Enter this area only when necessary.
- Connect any other safety locks provided before proceeding with the work.

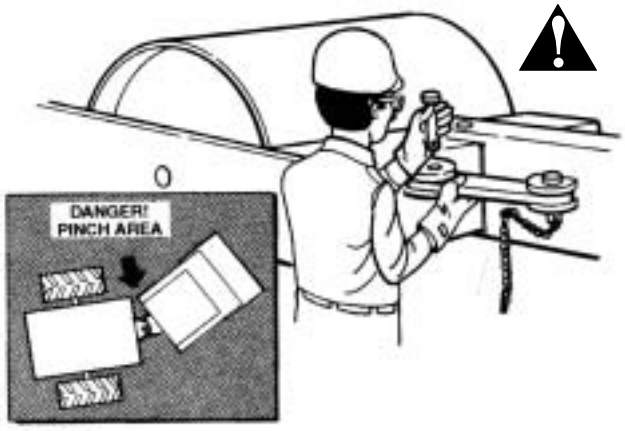


FIG. 33

Before beginning welding or burning operations, drain fuel lines and tank and move all flammable material to a safe distance, and be certain a fire extinguisher is readily available. When welding fuel tanks, either gasoline OR diesel, ALWAYS drain the tank, fill with water, and leave cap off during the welding operation.

All guards, plates and other safety devices must be properly replaced before the machine is returned to service or serious injury to you or other personnel may result.

AVOID burning or welding near acoustical material whenever possible, as **hazardous** fumes may be released. If unavoidable, make sure the area is adequately ventilated, and that a fire extinguisher is ready available.

ALWAYS use authorized replacement parts that meet the machine manufacturer's specifications.

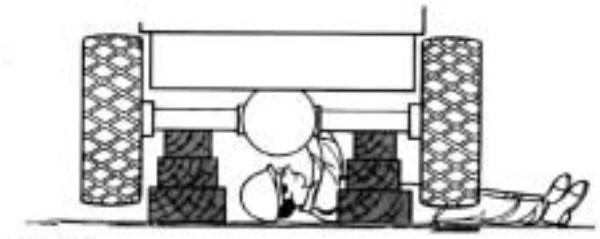


FIG. 34

JACKING AND BLOCKING

ALWAYS lower all movable attachments to the ground or to their lowest position before servicing a machine.

If a machine must be raised for servicing or repairs, ALWAYS block the machine securely. Use axle stands or other rigid supports of ample capacity. NEVER rely solely on the jacks for support. If necessary to work under a machine, be absolutely certain it is adequately supported. (FIG. 34)

WARNING: Never use concrete blocks for supports. They can collapse under even light loads.

When jacking up a machine, use a SUITABLE jack, placed in the proper position, on a solid foundation.

Before working on a machine, chock the drum and wheels securely … front and rear … in such a manner as to prevent movement in EITHER direction. Securely attach the steering frame lock to prevent the machine from turning.

PERFORM MAINTENANCE SAFELY

FIRE PREVENTION

Whenever possible use a nonflammable solvent to clean parts. Do not use gasoline or other fluids that give off harmful vapors.

If flammable fluids, such as diesel fuel, must be used, extinguish open flames or sparks and do not smoke.

Store dangerous fluids in a suitable place, in approved containers which are clearly marked. NEVER smoke in areas where flammable fluids are used or stored. (FIG. 35)

Use proper nonflammable cleaning solvents. Follow solvent manufacturer's instructions for use.

Always remove all flammable material in the vicinity of welding and/or burning operations.

ALWAYS keep the floor in the work area clean and dry. Oily, greasy floors can easily lead to falls. Wet spots, especially near electrical equipment, can be hazardous. (FIG. 35)

Know where fire extinguishers are kept – how they operate – and for what type of fire they are intended.

Check readiness of any fire detectors and fire suppression systems.

FIG. 35

FIRE PREVENTION CHECKLIST (FIG. 36)

- Remove debris such as rags, coal dust, oil, leaves, pine needles.
- Check and repair fuel and hydraulic leaks.
- Check and repair damaged wiring.
- Prevent hose and electrical wire harness abrasion.
- Tighten loose clamps and fittings.
- Secure loose wiring.
- Make sure guards and protective covers are in place.
- Make sure fire extinguisher is available and operable.

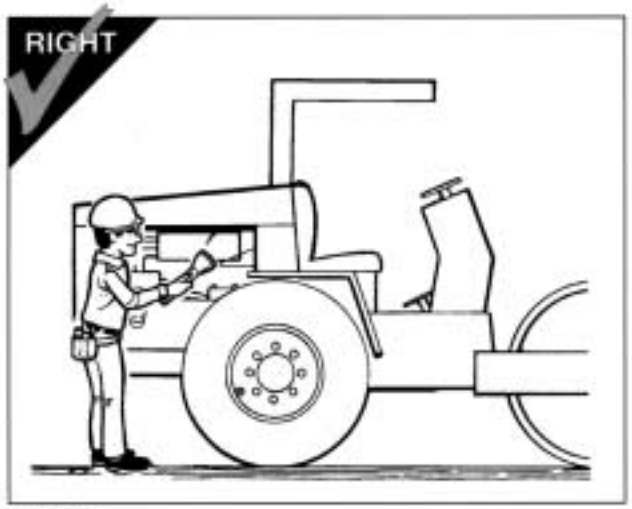


FIG. 36

PERFORM MAINTENANCE SAFELY

REFUELING (FIG. 37)

Precautions

When refueling, the following precautions must be followed:

- Add proper type and grade of fuel only when machine is not running and machine is parked with no one in the cab.
- Fuel in a well-ventilated area.
- Turn off all electrical switches.
- Turn off cab heaters.
- Open lights, lighted smoking materials, flames, or spark producing devices shall be kept at a safe distance while refueling.
- Keep fuel nozzle in contact with tank being filled, or provide a ground to prevent static sparks from igniting fuel.
- Do not spill fuel on hot surfaces.
- Any spillage shall be cleaned immediately.
- Do not start engine until fuel cap is secured to the fuel tank and people are clear of the machine.
- ALWAYS make sure fuel, oil, hydraulic fluid and water are added to their proper tanks.

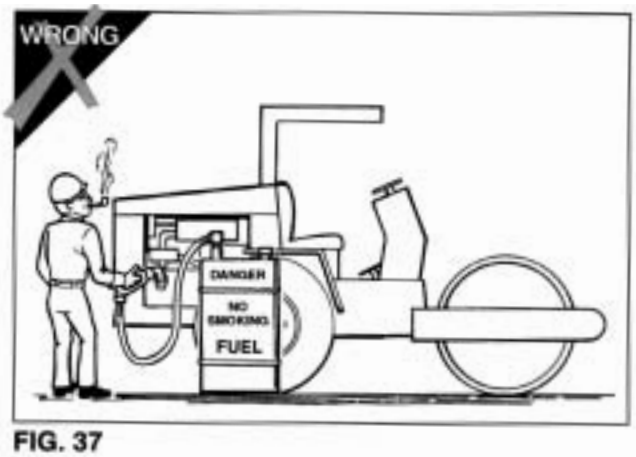


FIG. 37

SERVICING COOLING SYSTEM

When checking coolant level:

- Stop the engine and let the engine and radiator cool before checking. (FIG. 38)

If an overheated engine requires a shutdown:

- **Wait for the radiator to cool.** The hot pressurized coolant can cause burn injuries. Never add coolant to an overheated system.
- **Overheating is a symptom of trouble.** Stop the engine and have the trouble corrected before serious damage occurs.
- If it is necessary to check an overheated engine use a heavy cloth, gloves, heavy clothing and safety glasses or goggles to protect yourself. Stand to the side, turn your face away, and slightly loosen the cap. Wait until the sound stops before removing the cap.

FIG. 38

PERFORM MAINTENANCE SAFELY

SERVICING BATTERIES

Always wear safety glasses and gloves when working with batteries.

Before removing a battery, turn off all electrical equipment, then disconnect the negative (-) battery cable first. Before installing a battery, turn off all electrical equipment, then connect the positive (+) battery cable first.

To prevent sparking at the posts when using a battery charger, always turn the charger off or disconnect it from its power source before connecting or disconnecting charger leads to battery posts. Caps on all cells should be left on and the vent caps would be covered with a wet cloth.

Do not short across the battery terminals. The spark **could** ignite the gases.

BOOSTER CABLE INSTRUCTIONS (FIG. 39)

1. Connect positive (+) cable to positive post of discharged battery.
2. Connect other end of same cable to same marked post of booster battery.
3. Connect negative (-) cable to other post of booster battery.
4. Make final connection on stalled vehicle away from battery, either on vehicle frame or engine block.
5. Start vehicle and remove cables in reverse order of connection.

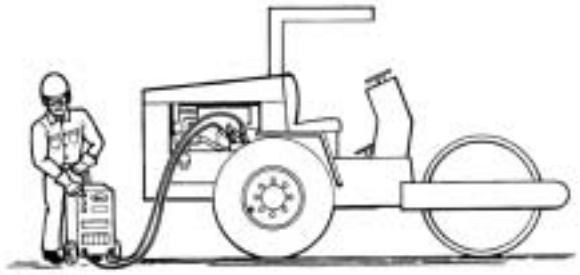


FIG. 39

BATTERY SERVICING

To prevent a battery explosion: (Fig. 40)

- **Maintain** the electrolyte at the recommended level. Check level frequently. Add distilled water to batteries only before starting up, never when shutting down. With electrolyte at the proper level, less space is available for gases to accumulate in the battery.
- **Use a flashlight** to check the electrolyte level. Never use a flame. (Fig. 41)
- **Do not short** across the battery terminals. The spark could ignite the gases.

Battery acid will **burn skin**, eat holes in clothing, and may **cause blindness** if splashed into eyes. If you spill acid on yourself flush skin immediately with lots of water. Apply baking soda to help neutralize the acid. If acids gets in your eyes, flush immediately with large amounts of water and seek proper medical treatment immediately.

When servicing batteries, remember that a lead-acid storage battery generates (when charging or discharging) hydrogen and oxygen – a very explosive mixture. A spark of flame could ignite these gases.

FIG. 40

FIG. 41

PERFORM MAINTENANCE SAFELY

HYDRAULIC SYSTEMS

NOTE: Hydraulic Systems have "special features". Some of the features affecting your safety are listed below.

Pressure can be maintained in hydraulic and air circuits long after the engine has been shut down. This pressure can cause hydraulic fluid or items such as pipe plugs to "shoot out" at high speed if pressure is not released correctly. **Release system pressure** before attempting to make adjustments or repairs.

Consult the manufacturer's instructions for correct procedure.

Before disconnecting **hydraulic fluid** lines, be sure you:

- Shut off engine.
- Always release any air pressure (supercharge) on the hydraulic reservoir.
- Move pedals and control levers repeatedly through their operating ranges to relieve all pressures.

Pressurized hydraulic fluid can penetrate the skin and **cause serious injury**. Therefore, be sure all connections are tight and that lines, pipes, and hoses are in good condition before starting the engine.

Fluid escaping from a small hole can be almost invisible. Use a piece of cardboard or wood, instead of your hands, to search for suspected leaks. (FIG. 42)

FIG. 42

HYDRAULIC SYSTEMS (CONT'D)

If you are struck by escaping **hydraulic fluid under pressure**, serious injury can occur if proper medical treatment is not administered immediately.

During operation, hydraulic fluid and air in an **unvented hydraulic tank** becomes heated and will tend to expand. This will raise the pressure inside an unvented hydraulic tank. If the filler cap is removed rapidly, the pressure in the tank can force the oil out of the tank very rapidly. **The hydraulic fluid may be very hot and may cause severe burns.** Always relieve tank pressure before removing the cap completely. Consult the manufacturer's instructions for the correct procedure.

When adding fluid to any system, be sure to use the fluid recommended by the manufacturer. Certain fluids, when mixed, may destroy seals causing loss of control and possible personal injury.

Keep hydraulic relief valve settings set to the manufacturer's recommendations. **Excessive pressures** could result in structural or hydraulic failures. Low pressure could result in loss of control. Either condition could cause **personal injury or death**.

Be sure the engine is stopped and machine is properly locked out and controls tagged, before working on a machine. Only run engine when it is essential, as in the case of pressure adjustments, lubrication, or tests. Follow the manufacturer's recommendations when making adjustments. Never resume operation until satisfactory adjustments have been made. **The operator must** follow the mechanic's instructions when adjustments are being made or machine is being serviced.

PERFORM MAINTENANCE SAFELY

TIRE INSPECTION

Recommended air pressure **must be maintained** in every tire. Daily checks assure that inflation is correct. If your periodic check discloses a tire that is continuously losing air, a leak is indicated and must be repaired. (FIG. 43)

During your pressure checks, also inspect for:

- Objects wedged between or embedded in tires.
- Missing valve caps and wheel lugs.
- Cuts, tears, and breaks that may need repair.
- Abnormal or uneven wear.
- Damaged or poor fitting rim or rim flanges.
- Projecting body hardware, loose fender bolts, spring clips – anything that could contact a tire.

Do not burn or weld on wheels or rims.

FIG. 43

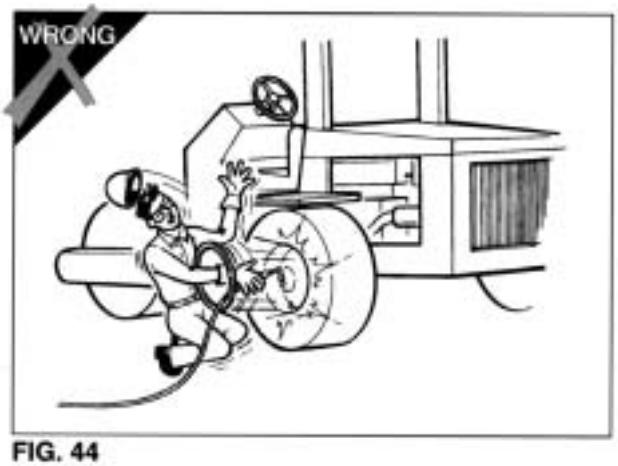


FIG. 44

PNEUMATIC TIRES

Changing tires or adding air can be a hazardous business. Special tools and procedures are required for changing off-highway tires.

Explosion and separation of a tire and/or rim parts can cause serious injury or death. (FIG. 44) Always follow the manufacturer's recommendations or see your tire supplier.

TIRE PRESSURE

Check tire pressure before starting operation. An air pressure rise during operation is normal and should NOT be reduced. Overloads or over-speeds may produce increased tire pressures due to heat. Never bleed tires. Reduce your load – or speed – or stop until tires cool.

ADD AIR

From a distance – with air chuck clipped on the tire valve – and with extension hose that permits you to stand behind tread. (FIG. 45) Always use a tire cage or equivalent for protection.

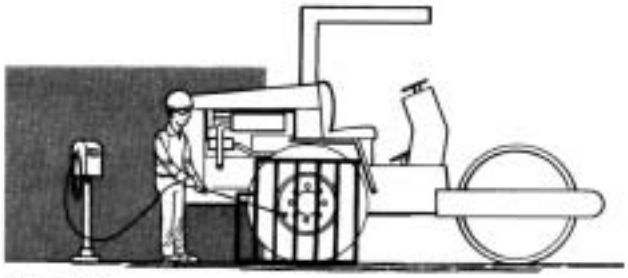


FIG. 45

PERFORM MAINTENANCE SAFELY

ROPS (Roll-Over Protective Structures)

Periodically inspect ROPS for cracks and loose mounting hardware.

Replace all missing, deteriorated or worn rubber parts.

If it becomes necessary to remove a ROPS, reinstall it only on the same machine, in its original position. (FIG. 46)

NEVER alter the ROPS in any way without the written approval of the manufacturer.

NEVER cut holes in or weld on ROPS without the manufacturer's approval.

NEVER attempt to repair a damaged ROPS – it must be replaced with a new unit, approved for that machine.

Periodically inspect seat belts for wear, tear, deterioration or excessive dirt. Replace them if necessary.

AIR CONDITIONERS

NEVER attempt to weld on or near air conditioners. Poisonous gas may be formed when refrigerant gas is exposed to a flame or excessive heat.

Maintenance and repair of air conditioners … except for very minor repairs or servicing … must be done only by an experienced air conditioner or refrigeration technician. (FIG. 47)

FIG. 46

FIG. 47

PARKING AND TRANSPORTING

ALWAYS select a level area to park in and, if possible, one where children are unlikely to be present. ALWAYS chock the front AND rear of the roller … even if leaving the machine unattended for short periods.

ALWAYS use EXTRA care when towing a roller … when maneuvering in tight places, when backing (visibility is reduced, and jackknifing must be avoided), and when operating on grades. NEVER operate a towed roller on steep grades or side slopes, as the possibility of tipping or loss of control is greater when towing a roller.

NEVER allow anyone to ride on a towed roller. And, unless absolutely necessary, never permit anyone in the "pinch" area between the towing vehicle and the towed roller.

When necessary to disconnect and park a towed roller, ALWAYS select a location which is level and, if possible, one where children are unlikely to be present. BEFORE disconnecting, ALWAYS chock the front AND rear of the roll, and block under the tongue.

Extreme care should be exercised when loading or unloading a walk-behind roller. It is generally best to stand behind and to one side rather than directly behind a machine being propelled up or down a ramp.

If the roller is designed to hang from the tailgate of a vehicle when being transported, ALWAYS be certain the hook brackets meet the roller manufacturer's specifications.

Special precautions must also be exercised when loading or unloading, transporting or servicing a towed roller. Consult your manufacturer's manual for specific details.

SPECIAL OPERATING AND MAINTENANCE PRECAUTIONS

FOR TOWED ROLLERS

Most general safety precautions covered earlier in this manual are also applicable to towed roller operation. Many other SPECIAL precautions must, however, be taken. Study your manufacturer's manual(s) relative to special considerations when towing. If you have questions or concerns, consult the manufacturer or your dealer.

ALWAYS use a tow tractor of sufficient weight, drawbar horsepower and braking capacity to properly control the towed roller. Proper weight balance and distribution is also essential.

ALWAYS block under the tongue of the towed roller BEFORE attempting to connect it to the towing vehicles or machine. NEVER attempt to lift heavy tongues or move towed rollers by hand. NEVER get any part of your body under the tongue when hitching or unhitching.

ALWAYS make sure the hitch pin is of the proper size, and securely locked in place before towing. (FIG. 48) If safety chains are provided, make sure they are properly and securely connected … at BOTH ends. Cross the chains under the tongue when connecting to the towing vehicle. If electrical or hydraulic connections are required, make sure the connections are properly and securely made.

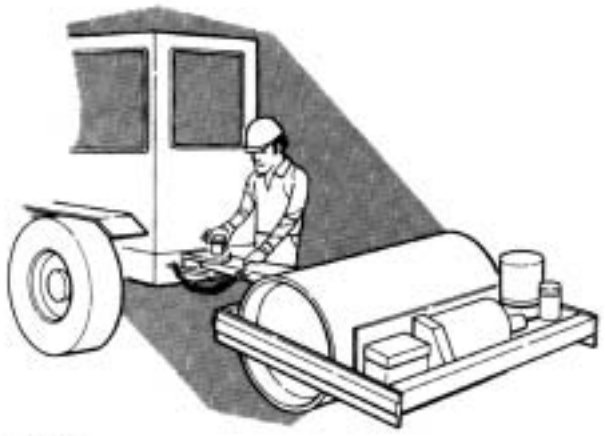


FIG. 48

FOR LANDFILL COMPACTORS

General

Operators of landfill compactors should carefully handle fill materials that could be picked up and thrown by the wheels, become lodged in the machine, or that are highly flammable.

Frequent checks should be made for wire, cable or other material wound around the axle members. Remove them immediately.

Travel with the blade as low as possible.

Maintain good operator visibility – keep all mesh and windows free of accumulated materials that reduce visibility.

When parking the machine, ALWAYS lower the blade.

FIRE PROTECTION

Maintain fire extinguishers and fire protective systems in good working order. ALWAYS recharge extinguishers, or replace with a fully charged unit immediately after use.

Check for, and remove, any waste material accumulation above belly pans and behind protective doors and grills. Accumulations are a fire hazard. (FIG. 49)

FIG. 49

SPECIAL OPERATING AND MAINTENANCE PRECAUTIONS

FOR WALK-BEHIND ROLLERS

Start-Up

NEVER attempt to operate a walk-behind roller before being thoroughly familiar with the manufacturer's operating instructions. If you have any questions or uncertainty, consult the manufacturer and/or his dealer BEFORE attempting to operate it.

ALWAYS follow the manufacturer's instructions for starting the engine. All controls MUST be in the correct position BEFORE attempting to start the engine (for example, the shift lever must be in neutral).

Starting fluid is NOT recommended when hand starting an engine. The engine may kick back.

OPERATION

When operating a walk-behind roller, ALWAYS exercise extreme care to avoid having your feet or clothing caught under the dolly wheels or roll. When possible, stand behind and to one side of the machine rather than directly behind it. Particular care must be exercised when operating near obstructions, on slippery surfaces, grades and side slopes. (ALWAYS wear slip resistant safety shoes or boots.)

NEVER ride on a walk-behind roller unless it is designed to accommodate riders and an appropriate seat is provided.

NEVER attempt to shift on a grade if the roller has a mechanical transmission.

NEVER operate a walk-behind roller in unshored trenches or near steep, unsupported banks. The vibrations could cause a cave-in.

Uneven grades can cause the handle to raise or lower unexpectedly, striking the unwary operator. (FIG. 50)

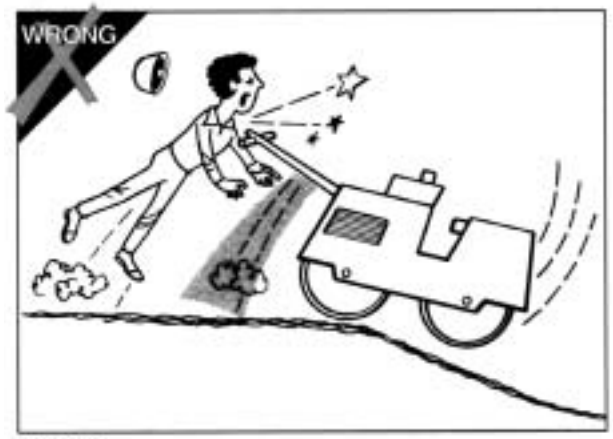


FIG. 50

Do you understand this AEM SAFETY MANUAL AND ITEMS SUCH AS …

- Your safety program?
- Your machine manufacturer's manual(s)?
- Proper clothing and personal safety equipment?
- Your machine's controls, warning signs and devices, and safety equipment?
- How to properly inspect, mount, and start your machine?
- How to check your machine for proper operation?
- Your work area and any special hazards that may exist?
- Proper operating procedures?
- Proper parking, shutdown, and dismounting procedures?
- Proper maintenance procedures?
- Proper loading and unloading procedures for transporting?
- Under what conditions you should not operate your machine?

If you do not understand any of these items, consult with your supervisor BEFORE operating your machine!

A FINAL WORD TO THE USER

Remember that YOU are the key to safety. Good safety practices not only protect you but protect the people around you.

You have read this safety manual and the manufacturer's manual(s) for your specific machine. Make them a working part of your safety program. Keep in mind that this safety manual is written for only this type of machine.

Practice all other usual and customary safe working precautions, and above all –

REMEMBER
SAFETY IS UP TO YOU

YOU CAN PREVENT SERIOUS INJURY OR DEATH

This manual is another in a series on the safe operation of machinery published by AEM.
For additional publications visit our web site at www.aem.org.

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